EPA/ROD/R03-02/002
2002

EPA Superfund
Record of Decision:

EASTERN DIVERSIFIED METALS
EPA ID: PAD980830533
OU 04
HOMETOWN, PA
11/26/2001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

SUBJECT: Eastern Diversified Metals Site
Record of Decision for Operable Unit Four

DATE: 11/26/01

FROM: Abraham Ferdas, Director
Hazardous Site Cleanup Division

TO: Thomas C. Voltaggio, Acting Regional Administrator
EPA Region III

Attached is the Record of Decision (ROD) for the Eastern Diversified Metals Superfund Site in Rush Township, Pennsylvania. Several minor changes were made to the ROD since the Proposed Plan was issued. EPA decreased the numerical values of the soil cleanup levels for dioxin, phthalates and lead in response to concerns expressed during the comment period from the public and the natural resource trustees. Because contaminants have not migrated deeply, EPA expects only a very minor change in the cost of the remedial action as the result of these reduced cleanup levels. Although the need to test for gas generation and determine the need for landfill gas controls is a normal part of landfill design, the ROD explicitly states this need, in response to concerns by the public.

The Wilkes-Barre office of the PADEP concurred with the selected remedy and their concurrence letter is attached.

I recommend that you sign the attached document.

Pennsylvania Department of Environmental Protection

2 Public Square
Wilkes-Barre, PA 18711-0790
November 15, 2001

Northeast Regional Office (570) 826-2511
FAX (570) 830-3051

Mr. Abraham Ferdes (3HS00)
Hazardous Site Cleanup Division
U.S. Environmental Protection Agency (EPA)
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Letter of Concurrence
Eastern Diversified Metals NPL Site
Rush Township
Schuylkill County

Dear Mr. Ferdes:

The Commonwealth of Pennsylvania Department of Environmental Protection has reviewed the July 2001 Final Record Of Decision (ROD) for Operable Unit 4 ("OU4") for the Eastern Diversified Metals ("EDM") NPL Site. This Record of Decision was developed by EPA to address a change in the remedial action for the fluff pile (OU3) and modify some aspects of the previous ROD for Operable Unit 1. EPA has selected in-place closure of the fluff pile.

The major components of the remedy include:

- Grading the fluff to less than 4:1 slopes and covering the fluff with a RCRA equivalent, multi-lined cap system.
- Excavation and placement under a RCRA equivalent, multi-layer cap of all site soils contaminated above the cleanup levels listed in the Record of Decision summary.
- Management of storm water runon/runoff and diversion of overburden groundwater around the cap containment system. This will be accomplished by controls such as storm water diversions/swales/basins, an upgradient trench for diversion of overburden groundwater, and relocation of the downgradient collection trench to contain impacted overburden groundwater and leachate for treatment. The impacted overburden groundwater and leachate will be conveyed to the existing site treatment plant for treatment prior to discharge to the Unnamed Tributary of the Little Schuylkill River.
- Study gas generation in the fluff pile and if necessary install a gas collection and treatment system.
- Groundwater monitoring and if necessary landfill gas monitoring

- Institutional controls to prevent certain access and to prevent damage to the cap and associated structures.

- Site inspections and maintenance to sustain the protectiveness of the cap.

- Elimination of the requirement to remove PCB hotspots detailed in the Record of Decision for OU1 due to EPA's conclusion that the PCB hotspots did not really exist and were the result of a lab analysis problem.

The Department concurs with the selected remedial action with the following conditions:

- EPA and the PRPs have claimed that the congeners PCB 1221 and PCB 1232 are not present at the Site. If found at the Site, the Department's Statewide Health Standards for these PCB congeners in Soil are PCB 1221 = 2.5 mg/kg and PCB 1232 = 2.1 mg/kg.

- The Department reserves all its rights related to future Remedial Actions and Remedial Design specific ARARs, to ensure compliance with Pennsylvania Act 2, Chapter 250, Administration of Land Recycling Program cleanup standards.

- EPA will assure that the Department is provided an opportunity to fully participate in any negotiations with responsible parties.

- This concurrence with the selected remedial actions is not intended to provide any assurance pursuant to CERCLA Section 104(c)(3), 42 U.S.C. Section 9604 (c)(3).

- The Department reserves its right and responsibilities to take independent enforcement actions pursuant to state and federal law.

This letter documents the Department's concurrence with the remedies selected by EPA in the ROD for the Eastern Diversified Metals Site. If you have any questions, please feel free to call me at the above number.

Sincerely,

W F McDonnell

William McDonnell
Regional Director
Northeast Regional Office

EXECUTIVE CORRESPONDENCE

SUPERFUND PROGRAM
RECORD OF DECISION

EASTERN DIVERSIFIED METALS SITE

OPERABLE UNIT 4
SCHUYLKILL COUNTY, PENNSYLVANIA

Final November, 2001

TABLE OF CONTENTS

PART I - DECLARATION

PART II - DECISION SUMMARY

Appendix I - Tables

Appendix II - Figures

Appendix III - OU3 Risk Assessment

Appendix IV - Design Criteria Elements

PART III - RESPONSIVENESS SUMMARY

RECORD OF DECISION
EASTERN DIVERSIFIED METALS SITE
Operable Unit 4

PART I - DECLARATION

I. SITE NAME AND LOCATION

EASTERN DIVERSIFIED METALS SITE
RUSH TOWNSHIP
SCHUYLKILL COUNTY, PENNSYLVANIA

II. STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedial action for Operable Unit 4 (Fluff Pile) and modifies some aspects of the previous ROD for Operable Unit 1 at the Eastern Diversified Metals Site in Schuylkill County, Pennsylvania. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, (CERCLA), 42 U.S.C.§§ 9601 et. seq.; and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the Administrative Record for this Site.

The Pennsylvania Department of Environmental Protection (PADEP), acting on behalf of the Commonwealth of Pennsylvania, concurs with the selected remedy.

III. ASSESSMENT OF THE SITE

Pursuant to duly delegated authority, and pursuant to Section 106 of CERCLA, 42 U.S.C. Section 9606, I hereby determine that actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

IV. DESCRIPTION OF THE SELECTED REMEDY

The problems at the Eastern Diversified Metals Site are complex. In order to simplify and expedite remedial action at the Site, EPA has divided the Site into manageable components called “operable units” (OUs). The OUs are as follows:

OU1 hotspot areas (fluff and soil areas contaminated with dioxin above target levels) sediments and soils contaminated with metals above target levels miscellaneous debris

OU2 ground water

OU3 the remainder of the fluff pile.

After EPA was unsuccessful in recycling the fluff as required by the ROD for OU3, EPA defined the new fluff remedial actions studied in a new Focused Feasibility Study as:

OU4 change in remedy for OU3 and minor changes to past RODs. This numbering change was made to accommodate the structure of EPA’s accomplishment tracking data base system.

Non-ground water components of the remedy selected in the March 1991 ROD addressed what EPA has determined to be the principal threat at the Site, the dioxin-contaminated areas of the fluff pile. This principal threat has been addressed by a removal action at the site, with the contaminated fluff sent to an offsite hazardous waste incinerator. The 1991 ROD also addresses some fluff contaminated with moderate levels of PCBs; metals-contaminated soils and sediments; miscellaneous debris; and surface water (OU1).

The ground water components of the remedy selected in the March 1991 ROD were intended as an interim action to initiate shallow ground water restoration, while collecting additional information on the practicability of deep ground water restoration. A leachate collection and treatment system has been constructed and it addresses the risk from shallow ground water and leachate. The No Action ROD issued in September 1993 addressed the deep ground water at the Site (OU2).

The remedy selected in the July 1992 ROD was intended to reduce or eliminate threats presented by the remaining fluff by recycling this material and properly disposing of hazardous residuals (OU3). The alternative selected in that ROD (recycling) was found to be impractical after aggressive efforts to recycle the material failed. This ROD selects a containment remedy for the massive fluff pile present at the EDM Site. This ROD also revises several aspects of previous RODs which need to be changed. This will be the final ROD for the EDM Site. The ROD contains the following elements:

- Grading the fluff pile to less than 4:1 slopes and covering the fluff pile with a RCRA equivalent multi-lined cap system.

- Excavation and placement under a RCRA equivalent, multi-layer cap of all site soils contaminated above the cleanup levels listed in this Record of Decision Summary.

- Management of storm water runon/runoff and elevated overburden ground water around the cap containment system.

- Study gas generation in the fluff pile and if necessary install a gas collection and treatment system

- Ground water monitoring and if necessary landfill gas monitoring

- Institutional controls to prevent certain access and to prevent damage to the cap and associated structures.

- Site inspections and maintenance to sustain the protectiveness of the cap

- Elimination of the requirement to remove PCB hotspots detailed in the Record of Decision for OU1 due to EPA’s conclusion that the PCB hotspots did not really exist and were the result of a lab analysis problem.

V. ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site.

- Chemicals of concern and their respective concentrations.
- Baseline risk represented by the chemicals of concern.
- Cleanup levels established for chemicals of concern and the basis for these levels.
- How source materials constituting principle threats are addressed
- Current and reasonably anticipated future land use assumptions and current and future beneficial uses of ground water used in the baseline risk assessment and ROD.
- Potential land and ground water use that will be available at the Site as the result of the Selected Remedy.
- Estimated capital, annual operation and maintenance costs (O&M), and total present worth costs, discount rate and the number of years over which the remedy costs are projected.
- Key factors which led to selecting the remedy

VI. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective.

This remedy utilizes permanent solutions and alternative treatment technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because the selected remedy in the previous ROD for Operable Unit 1 will result in hazardous substances remaining onsite, a review under Section 121(c) of CERCLA, 42 U.S.C. §9621(c), will be conducted within five years after initiation of the Operable Unit 1 remedy to ensure that the selected remedy is providing protection of human health and the environment.

Thomas C. Voltaggio
Acting Regional Administrator
Region III

Date NOV 26 2001

RECORD OF DECISION

EASTERN DIVERSIFIED METALS

PART II - DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

The Eastern Diversified Metals Site ("EDM") is located in Rush Township, Schuylkill County, Pennsylvania and is approximately one mile northwest of the intersection of Routes 54 and 309 in the town of Hometown. The Site is approximately 1000 feet west of Lincoln Avenue (SR1021) at the western end of a light industrial park. The EPA Site ID number, used in EPA's national database of NPL Sites is PAD 980830533. EPA is the lead agency and the Commonwealth of Pennsylvania is the support agency for the EDM Site. The Site is an industrial property containing a massive waste pile of chipped plastics composed of aluminum and copper wire insulation ("fluff").

The Site originated as a processor of aluminum and copper wire. The EDM facility used a chipping process to remove the insulation from the wire and cable and separated the copper and aluminum, which was then sent for recycling. The waste from the chipping process was dumped in a waste pile at the Site, and down the hill behind the processing building creating a mountainous waste pile of chipped plastic insulation ("fluff pile") which was exposed to the elements.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The EDM Site is a closed metals reclamation facility located in Rush Township, Schuylkill County, Pennsylvania (see Figure 1 - Note: All ROD figures are found in Appendix II). Between approximately 1966 and 1977, the Eastern Diversified Metals Corporation ("EDM") reclaimed copper and aluminum from wire and cable inside a processing building on the EDM property. Plastic insulation surrounding the metal cable and wire was mechanically stripped and separated from the metal using gravitational separation techniques employing air and water. EDM placed the waste insulation material on the ground behind the processing building, over time forming the "fluff pile." Since this material was disposed before the Resource Conservation and Recovery Act of 1980 ("RCRA"), the fluff pile is not subject to the RCRA hazardous waste regulations, as long as the material is not taken out of the area of contamination or treated. EPA however, may deem that some aspects of those regulations do apply under CERCLA when the regulations are both relevant and appropriate for the site conditions.

The fluff from the wire insulation was composed primarily of polyethylene plastic ("PE") and polyvinyl chloride plastic ("PVC"). Additionally, the fiber used to separate the wires from the outside sheath contributed a biodegradable component. Many compounds are added to wire insulation to improve the properties of the plastics. This includes lead, zinc, phthalates and possibly PCBs, as well as many other compounds. Plastics break down under sunlight and as the plastics weather releasing these compounds. This is the primary source of contamination at the EDM site.

<u>State Enforcement History</u>

- December 1970: The Pennsylvania Department of Health inspects the site and determines that the site disposal area is accumulating enough waste to require a solid waste disposal permit.

- April 1971: EDM submits an application to the Pennsylvania Department of Health to operate a 25 acre landfill at the Site.

- February 1972: The Pennsylvania Department of Health inspects the Site and finds EDM in violation of Pennsylvania's Clean Streams Law as a result of leachate from the pile entering the on-site stream.

- December 1973: The Pennsylvania Division of Solid Waste Management informs EDM that a permitted leachate collection and treatment system and a ground water monitoring system needs to be installed before a landfill permit can be issued.

- March 1974: The Pennsylvania Department of Environmental Resources (“PADER”) (Currently the Pennsylvania Department of Environmental Protection -“PADEP”) and EDM enter into a Consent Order to install a leachate collection and treatment system. EDM constructs the required systems and submits an application for a Water Quality Management Permit.

- December 1975: EDM receives a National Pollutant Discharge Elimination System (“NPDES”) permit and the water treatment system begins operations. The treatment plant is still operating and is part of a leachate management system that also includes erosion control measures, surface diversion ditches, and two shallow ground water interceptor trenches that convey leachate to an on-Site treatment plant. The treatment plant operated under an NPDES permit issued by the PADEP, Bureau of Water Quality Management until 1997 when the permit expired. Under CERCLA, a formal permit is not required, but the plant must meet permit equivalent discharge requirements. The treated effluent discharges to an unnamed tributary leading to the Little Schuylkill River.

- 1977: EDM ceases all operations at the facility and transfers ownership to Theodore Sall, Inc. (“Sall”). The building housing the processing equipment is sold to Bernard Gordon. The property is managed by a Sall employee, who operates the treatment plant, conducts maintenance, and handles Site security.

- June and November 1979: Hometown Fire Department extinguishes small fires on portions of the main fluff pile. Sall excavates the burned areas and installs temperature sensors. In 1987, pursuant to a Consent Order with EPA, Sall constructed a chain link fence around the Site. No fires have occurred since the fence was installed. Dioxins are produced in smoldering fires when chlorine is present. The smoldering PVC was a rich source of chlorine for the production of dioxins and one area of the fluff pile contained high levels of dioxin which required removal/incineration.

- 1983 and 1984: PADER conducted a chemical and aquatic biological investigation of the Little Schuylkill River, all of its tributaries and all of its point source discharges, including the EDM Site. PADER concluded that an evaluation of the effect of the EDM Site on the Little Schuylkill River could not be made due to the acid mine drainage conditions in the area.

<u>EPA Involvement Begins</u>

In 1985, EPA sampled the site soil, surface water, leachate, stream sediment, leachate runoff path sediment and ground water to gather data in order to further assess the site. Sall hires an independent contractor to sample and analyze the surface water, ground water, leachate, fluff and soils on the EDM Site.

Sampling activities completed between 1984 and 1987 by Sall, PADER, and EPA revealed the presence of **organic** compounds including phthalates, phenols, ethyl benzene, toluene, and polychlorinated biphenyls (**“PCBs**”) in the seeps and sediments, and **inorganic** contaminants including lead, copper, zinc, aluminum, and manganese in surface water, sediments, and leachate seeps.

The Site was proposed for inclusion on the **National Priorities List (“NPL”)** in June 1986, and was formally placed on the NPL in September 1989. Between 1987 and 1990, Sall and AT&T Nassau Metals Corp. (“AT&T”) conducted a Remedial Investigation (“RI”), Risk Assessment (“RA”) and Feasibility Study (“FS”) for the Site under a Consent Order with EPA. This Consent Order was signed on October 19, 1987. The RI characterized the nature and extent of contamination present at the Site; the RA evaluated the risk to public health and the environment posed by the Site; and the FS described various cleanup technologies for addressing Site contamination. In February 1991, EPA issued a Proposed Remedial Action Plan in which EPA divided the Site into operable units ("OUs") as follows:

OU1 hotspot areas (fluff and soil areas contaminated with dioxin and PCBs above cleanup levels)
- sediments and soils contaminated with metals above target levels
- miscellaneous debris
- upgrade leachate treatment plant

OU2 ground water
OU3 the remainder of the fluff pile

ROD #1- Operable Unit 1
On February 19, 1991, EPA held a public meeting on the Proposed Plan, and in March 1991, issued its Record of Decision ("ROD") in which EPA selected incineration of the principal threat, fluff, and soil areas (those areas contaminated with dioxin and moderate levels of PCBs); removal of contaminated stream bed sediments, metals- contaminated soils, and miscellaneous debris; stabilization of incinerator residuals, soils, and sediments, if necessary; enhanced shallow ground water collection; and further study of the deep ground water system. This shallow ground water is overburden ground water/ leachate. At the time of this ROD, EPA's analytical results indicated that PCB concentrations above 25 ppm were localized in a few small areas, but in these small areas, concentrations were very high.

Unilateral Order #1 - for ROD#1
In September 1991, EPA issued a Unilateral Administrative Order ("Order") to AT&T and Sall pursuant to Section 106 of CERCLA, requiring AT& T and Sall to implement portions of the remedy described in the March 1991 ROD. This Order only required debris removal, additional ground water studies, fence maintenance and continued monitoring be conducted. The order did not require implementation of the remedy for removal and incineration of the PCB and dioxin hotspot areas, upgrade of the leachate treatment plant, sediment removal, upgrade of the storm water lagoon, or installation of additional leachate collection trenches. Remedial Design for removal of the miscellaneous debris was completed in late 1992. In 1993, approximately 6,600 cubic yards of debris (consisting of unprocessed wire, wood, scrap metal, soil, and fluff) were removed from the Site and transported to a hazardous waste landfill for disposal.

Unilateral Order #2 for ROD#1
On March 2, 1994, EPA issued an Order which required that Nassau Metals (a subsidiary of AT& T which subsequently became Lucent) to implement the remaining remedial actions required by the September 1991 ROD, including dioxin hotspot removal, upgrade of the leachate treatment plant, sediment removal from the adjacent stream, upgrading the storm water lagoon and installation of additional leachate collection trenches.

Hotspot Removal

In September 1991, AT&T petitioned EPA to reopen the March 1991 ROD (ROD-OU1), claiming that the PCB analytical results reported and relied on in the RI, RA, and FS were inaccurate. Along with their petition, AT& T attached more recent analytical data showing that PCBs were present at lower concentrations in the PCB hotspot area than indicated by the original analyses. In December 1991, AT& T sampled the fluff material and, with the aid of analytical techniques which were not available at the time the original analyses were performed, determined that the levels of PCBs in the fluff material were, in fact, lower than was previously believed. These analyses also revealed the presence of **Polychlorinated Naphthalenes ("PCNs")** in what was formerly defined as the "PCB hotspot" area. It appears that the reported PCB levels were due to a misidentification by the lab analysis of PCNs as PCBs. PCNs may have been used as a fire retardant to coat the wire, or in the paper insulation in some electrical wire and cable. A mini-RA by Dr. Roy Smith, of EPA, was performed and a memo was sent to Steve Donohue dated April 6, 1994 which documented the results. The RA concluded that the PCNs in the fluff appeared to pose no significant health risk to workers if the fluff were recycled. The assessment however noted the lack of detailed studies on PCNs. A review by the Site toxicologist confirmed that there is still relatively little toxicological data on PCNs and there are no federal or state standards. The molecules are large and like PCBs, are relatively immobile. Additional detailed studies of the fluff material were conducted during the design phase of the recycling remedy. Numerous samples indicated that the average PCB concentrations were about 50-60 ppm, and individual fluff sample concentrations ranged from 15 to 125 ppm. Virtually all samples collected contained less than 100 ppm PCBs.

At the time of the March 1991 ROD, EPA believed that there were only small hotspots of PCBs and that incineration was both appropriate and cost effective. An unusually rigorous human health based performance standard required the excavation and incineration of all fluff with PCB concentrations either above 25 ppm, or above a number to be defined by fate and transport modeling. However, no fate and transport modeling was ever conducted for PCBs at the Site by EPA. Based on more recent PCB sample analysis of the fluff pile, EPA does not believe that fate and transport modeling is necessary or appropriate.

As written, the March 1991 ROD would have required the incineration of the entire fluff pile because it is above 25 ppm PCBs. When EPA selected incineration for the hotspots, EPA expected to incinerate a relatively small amount of material, not the entire fluff pile. EPA generally only selected incineration for much higher levels of PCBs than the levels present in the fluff. Additionally, this fluff is 30 percent PVC, which can produce high levels of dioxin when incinerated. In fact, when pilot tests of a similar wire fluff were conducted at another Superfund Site (i.e., MW Manufacturing Site), high dioxin emissions were produced. The production of dioxins led to a change in the remedial action at the MW Site. Thermal desorption will now be used at the MW Site instead of incineration and the treated soil will be placed under a soil cover. In summary, the alternatives presented in the Proposed Plan for OU-4 will address all of the fluff pile, and incineration is not necessary or appropriate.

The 1991 Unilateral Order did not require incineration of PCB hotspots; (greater than 50 ppm) because of the evidence submitted by AT&T which indicated that hotspots of PCBs did not exist. Fate and transport modeling <u>was</u> conducted for dioxin migration which produced a cleanup level that was higher than the performance standard of 20 ppb. The ROD required that dioxin contaminated fluff be removed to less than 20 ppb or to a level defined by fate and transport, whichever was lower. Therefore, the lower performance standard of 20 ppb dioxins was used for the dioxin removal action.

In 1993, Lucent excavated approximately 600 cubic yards of dioxin- contaminated fluff from several onsite burn areas, placed the material in containers and eventually sent the material for offsite incineration. Additional fluff was excavated from the dioxin burn area on-site in 1997, 1998 and 1999. The dioxin removal proceeded in stages, because incineration is extremely expensive (approximately $2,000/cubic yard). Therefore, layers were removed and then the surface of the excavation was tested to avoid excavating and mixing clean fluff with contaminated fluff. It sometimes took more than two months to receive verified analytical results because analysis for dioxins is very difficult. There was only one incinerator in the country that could accept the dioxin contaminated fluff and this incinerator was often unavailable due to other projects or shutdowns. This “surgical” approach minimized costs, but took a very long time to complete. Through 1997, a total of more than 1,000 cubic yards of dioxin contaminated fluff and debris were excavated and transported to an offsite incinerator for thermal treatment and disposal. In 1998, an additional 600 cubic yards of dioxin contaminated fluff was sent offsite for incineration. A major fluff removal action occurred in the Fall of 1999, when a window of opportunity opened to transport the fluff material to the Aptus Incinerator located in Kansas. More than 3 million pounds of dioxin contaminated fluff have been removed to date at a cost of more than $4 million to Lucent. While a substantial amount of material has been removed, the remaining fluff pile is estimated to weigh approximately 350 million pounds. EPA and Lucent Technologies believe that all dioxin contaminated fluff above 20 ppb has been removed, but some underlying soils in this area are still contaminated with dioxin. These soils will be addressed in this ROD.

Leachate Treatment System, Stormwater Basin and Leachate Collection System - As required by the above referenced Unilateral Order (3/94), the treatment system was upgraded to provide added capacity, biological treatment and removal of zinc by using a specialized resin. At that time, the system was operated by Sall, and Lucent was reluctant to take over the operation and upgrade the treatment plant. EPA issued a Removal Order dated August 4, 1994, which ordered Lucent to begin operating the plant and to implement the upgrades to the treatment plant. Lucent complied with this removal order. Fluff pile leachate is now collected and treated in the expanded subsurface system which was constructed in 1995, and which was repaired and enhanced in the fall of 1998. In 1996, a new storm water collection and treatment system was installed at the Site to prevent erosion and runoff water from carrying fluff from the Site. Construction of a biological treatment plant and 20,000 gallon equalization storage tank addition to the Site Treatment Plant ("STP") was started in 1997 and completed in the Spring of 1998. In the fall of 1998, repairs were made to the leachate collection trench at the Site and additional leachate seep collectors were constructed near the storm water runoff basin and downstream of the STP on the unnamed tributary of the Little Schuylkill River. The leachate/ shallow ground water continues to be collected and treated by the STP pursuant to the OU1 ROD.

Sediment removal - Sediment removal from the adjacent stream has been deferred until after the final construction of the cap and associated system is completed. During the substantial regrading that will be necessary, it will probably be impossible to avoid some contamination of the stream. Deferring this action will avoid contaminating a clean area during the cap Remedial Action.

<u>ROD#2 - Operable Unit 3</u>

In July 1992, EPA issued the second ROD for the remainder of the fluff pile. The fluff consists of PVC and PE (plastic chips) metal, fibrous material, paper, soil and clay. This ROD selected recycling of the fluff material into either a final product, or another form that would undergo further processing off-site in order to produce a final product. The 1992 ROD additionally called for, among other things, testing and appropriate disposal of any recycling residuals and sampling and analysis of soils underlying the fluff pile.

<u>Unilateral Order 1 - for ROD#2</u>

EPA issued a Unilateral Order on June 25, 1993 which required implementation of the recycling remedy for the fluff pile.

A pre-design study was completed in November of 1994. Treatment tests and a pilot study on fluff separation and recycling were finished in late 1995 and early 1996. The fluff pile fractions separated during the treatment tests contained PCBs at levels which prevented the original recycling remedy. Additionally, the quality of the plastic was low and EPA was unable to find a viable market for the fluff pile plastics. EPA decided that the remedy could not be implemented and that a new remedial action needed to be selected.

<u>ROD#3 - Operable Unit 2</u>

In 1993, EPA finalized a Supplemental Hydrologic Investigation ("SHI") Report of the Site, which was conducted by contractors for AT&T. The SHI documented the investigation of the presence and movement of ground water contaminants within the Site area. In general, the SHI confirmed that ground water flow in the Site area follows the surface topography, i.e., it flows from the higher elevations to the lower elevations in the valley. The bedrock underlying the Site is characterized by fractures, faults and "bedding planes" that represent the layers in which the rock was originally formed or laid down. Ground water follows the path of least resistance and flows through these cracks in the rock. In some limited circumstances, these pathways may produce ground water flow perpendicular to, or against the surface slope of the land, but the resultant flow will be toward the unnamed tributary, the valley bottom wetlands, and ultimately the Little Schuylkill River.

The SHI confirmed that a **plume of volatile organic compounds ("VOCs")** originates at an unknown source at the top of the valley and that the northern fringe of this plume passes beneath the Site in both the overburden and bedrock. Trichloroethene ("TCE") was the primary contaminant detected in this plume. A well upgradient of the Site contained 150 **parts per billion ("ppb"**) of TCE and 6 ppb of carbon tetrachloride. The Maximum Contaminant Level ("MCL") of TCE and carbon tetrachloride allowable in drinking water is 5 ppb. The concentration of TCE and carbon tetrachloride in ground water under the Site was lower than in the well upgradient of the Site.

The SHI showed that a second upgradient well, chosen to establish **background** contaminant levels, contained toluene, ethyl benzene and xylene. These contaminants were also found in samples taken from onsite wells, but the concentrations were not significantly different from those samples taken from the upgradient background wells. Several other VOCs were also detected at lesser concentrations in the ground water in the Site area.

Manganese is an inorganic contaminant that was detected in ground water near the Site area. While there is no primary health- based MCL for manganese, there is a secondary MCL of 50 ppm based on taste and odor. Additionally, there is a Maximum Contaminant Level Goal **("MCLG")** for a concentration of this metal in drinking water. The concentration of manganese in the ground water in eleven of the fourteen wells sampled in the SHI exceeded the MCLG of 200 ppb. However, the upgradient wells also exceeded the MCLG for manganese suggesting that manganese is naturally occurring in the area. Two of the wells downgradient of the Site had manganese detections of 4,840 ppb and 7,420 ppb, which were significantly higher than both background levels and the MCLG. There were no residential wells between the Site and its probable discharge to the Little Schuylkill River.

As explained previously, based on information collected during the RI, EPA concluded that the elevated VOCs and manganese in deep ground water did not appear at that time to be due to Site activities. Based on the above studies, EPA issued a ROD in September 1993, selecting "No Action" for the deep groundwater at the Site.

<u>Consent Agreement - for Study to Change remedy in ROD#2 - called OU4</u>

On June 17, 1997, EPA and Lucent (previously Nassau Metals Corporation) entered into an agreement which required Nassau Metals Corporation to perform a Focused Feasibility Study ("FFS") to determine other ways to address the fluff pile. A draft FFS was submitted to EPA in August 1998. The draft FFS evaluated various options which included on-site excavation, treatment and off-site disposal of the fluff. In late August 1998, Lucent Technologies submitted a second document to EPA which proposed a remedy of in-place closure or capping of the main fluff pile at the Site. In response to EPA's technical concerns regarding the feasibility of in- place closure, Lucent conducted studies in the Spring and Summer of 1999, which revealed that on-site closure is technically viable. During this time frame, several elected officials expressed opposition to on-site closure. EPA conducted a Town Meeting in the Summer of 1999 to explain the Agency's future plans.

<u>ROD#4 - OU4</u>

The Proposed Plan for OU4 was issued in October 2000 and the public meeting was conducted on November 20, 2000. This ROD is based on that Proposed Plan and the FFS for OU4 which is located in the Administrative Record at the local repository in Hometown. This is the final ROD for the EDM Site.

<u>Consent Decree for Cost Recovery</u>

In 1993, Sall declared bankruptcy and EPA pursued certain generators at the Superfund Site. A Consent Decree was signed on September 20, 1994 in which Region III entered DeMinimis settlements with sixty- five PRPs. The money was placed in a Special Account which will be used for Site cleanup activities. Lucent Technologies may be eligible to use these funds for the Site cleanup if they enter into a Consent Decree with EPA to conduct the Site cleanup required by this ROD for OU4.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI and RAs used as the basis for the previous RODs are also the basis for this ROD. However, EPA’s toxicologist reviewed the RA to make sure that EPA’s new methodologies would not change the conclusions in the RA. Although some minor changes in the numbers might result if the new methodologies were used, the conclusions would remain the same. The toxicologist also developed risks at different soil cleanup levels, which were used by EPA to set the soil cleanup levels. These new calculations and supporting documents were added to the Administrative Record along with the new FFS and other associate documents which support this ROD. These documents were made available to the public on October 18, 2000. They can be found in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region 3 and at the office of the Rush Township board of Supervisors at the following locations:

Rush Township Board of Supervisors ATTN: Carol Opet R. D. 1 Tamaqua, PA 18252 (717) 668-2938	U.S. EPA Docket Room Ms. Anna Butch (3HS11) Region III 1650 Arch Street Philadelphia, PA 19103-2029 (215) 814-3157

The notice of the availability of these two documents was published in the Pottsville Republican and the Times News on October 18, 2000. A public comment period was held from October 18, 2000 to November 16, 2000. An extension to the public comment period was requested and an extension granted to December 16, 2000. At the public meeting, EPA answered questions about problems at the site and the remedial alternatives. EPA also used this meeting to solicit a wider cross-section of community input on the reasonably anticipated future land use and potential ground water uses at the site. EPA’s response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

As with many Superfund sites, the problems at the EDM Site are complex. As a result, and in order to simplify and expedite remedial action at the Site, EPA has divided the Site into manageable components called “operable units” (OUs). The OUs are as follows:

OU1 hotspot areas (fluff and soil areas contaminated with dioxin above target levels) sediments and soils contaminated with metals above target levels miscellaneous debris
OU2 ground water
OU3 the remainder of the fluff pile.

After EPA was unsuccessful in recycling the fluff as required by the ROD for OU3, EPA defined the new fluff remedial actions studied in a new FFS as:

OU4 change in remedy for OU3 and minor changes to past RODs

Non-ground water components of the remedy selected in the March 1991 ROD are intended to address what EPA has determined to be the principal threat at the Site, the dioxin-contaminated areas of the fluff pile. This principal threat has been addressed by a removal action at the site. The 1991 ROD also addresses fluff contaminated with moderate levels of PCBs; metals-contaminated soils and sediments; miscellaneous debris; and surface water (OU1).

The ground water components of the remedy selected in the March 1991 ROD were intended as an interim action to initiate shallow ground water restoration, while collecting additional information on the practicability of deep ground water restoration. The No

Action ROD issued in September 1993 addressed the deep ground water at the Site (OU2).

The remedy selected in the July 1992 ROD was intended to reduce or eliminate threats presented by the remaining fluff by recycling this material and properly disposing of hazardous residuals (OU3). The alternative selected in that ROD (recycling) was found to be impractical after aggressive efforts to recycle the material failed. This ROD for OU4 details the remaining viable alternatives evaluated in the FFS for the fluff pile and selects a final remedy for the fluff and contaminated soil at the Site. This ROD also modifies several aspects of previous RODs which needed to be changed. This will be the final ROD for the EDM Site.

V. SUMMARY OF SITE CHARACTERISTICS

The Site is situated in a valley that slopes down to the west. At the bottom of the valley is a lagoon to capture runoff and the leachate treatment plant (Figure 2). The Site is bounded by an industrial park to the south and east of the Site (Figure 3). On the north, the Site is adjacent to Conrail railroad tracks and, beyond the tracks, private property zoned as residential. One house is present on the property zoned as residential, but the rest of this property is currently forested. To the west of the Site are state gamelands and the Little Schuylkill River. The Little Schuylkill River flows in a south-southeasterly direction approximately 250 feet west of the Site. The Little Schuylkill River has been degraded by acid mine drainage. A small tributary flows westerly along the southern border of the Site in the valley bottom, discharging to the Little Schuylkill (Figure 2). This tributary has been contaminated by runoff from the Site. The Site covers approximately 25 acres and contains partially forested land; an 8-acre pile of plastic “fluff”; and areas of contaminated soil, sediment, surface water and ground water. Fortunately, exposure to the Site is currently limited to Site workers, because of the surrounding land use and the Site fence. The only property that could be developed for residential use is located to the north of the property, and is separated from the Site by railroad tracks. The economy of the Hometown area is not growing rapidly and it is unlikely that there will be substantial residential development adjacent to the Site in the near term.

The fluff is residual material produced from the separation of insulation from copper and aluminum communication and power wire and cable. It is composed primarily of PVC and PE insulation chips, with some fibrous material, paper, soil, and metal. An estimated 350 million pounds of fluff are present on-site in a pile approximately 250 feet wide, by 1,500 feet long, by 40-60 feet high. The primary current threat at the Site is the lead content of the fluff, which ranged as high as 40,000 ppm in one sample, although the average lead level is generally between 3,000 and 11,000 ppm lead. The highest lead sample concentration in Site soils was 1920 ppm. Lead was added to the plastic insulation to improve the properties of the plastic and also was present in some pigments. The wire insulation specifications called for the addition of about 3% lead to the PVC insulation which would be about 30,000 ppm of lead in the PVC fraction. Chipping the insulation exposes some lead particles that were impregnated into the plastic insulation. Additionally, plastics decompose when exposed to sunlight, releasing the lead and other contaminants. The plastic fluff has been exposed to the elements for many years, causing this material to fail the Toxicity Characteristic Leaching Procedure (“TCLP”) test for lead. The TCLP is a test which simulates the conditions within a landfill to measure the potential for contaminants to leave the waste and travel to ground water. Consequently, the fluff must be managed as a RCRA hazardous waste if it is removed from the site or treated and replaced. However the Synthetic Leaching Procedure, which more realistically approximates actual Site conditions did not indicate a significant leaching potential. The raw leachate from the fluff pile contained only about 50-100 ppb lead, while the EPA action level for lead is about 15 ppb.

The fluff also contains PCBs at average concentrations of 50 to 60 ppm. Wastes containing PCBs at average concentrations above 50 ppm must be managed as PCB waste under the Toxic Substances Control Act (“TSCA”). The highest reliable sample result of PCBs in the raw fluff was 125 ppm, while the lowest concentration was approximately 16 ppm. Although PCBs are present in the fluff, they appear to be embedded in the plastic and are not leaching significantly. Samples subjected to the TCLP test were “non-detect” with a detection level of 10 ppb. The PADEP collected leachate and treatment plant effluent samples in December 2000 and analyzed the samples for PCBs. At a detection level of 0.25 ppb, PCBs were not detected in any of the samples. Although the fluff must comply with the TSCA regulations because of total PCB concentrations, the actual risk from these contaminants is not very high because of their preference to stay in the plastic matrix which results in a relatively low mobility. The PCBs are embedded in and adsorbed onto the plastic and are not very leachable. In fact, a leaching test (SPLP) produced PCBs in the leachate of less than 10 ppb. The influent leachate (before treatment) to the EDM treatment plant contained less than 0.25 ppb of PCBs when sampled in December 2000.

Another concern discussed in the introduction to this Proposed Plan is the presence of dioxin produced during a fire in the fluff pile. The current removal action, which is nearly completed, provides for a cleanup level of 20 ppb of dioxins. Although this level is at the high end of concentrations recommended for industrial sites by EPA guidance, the remaining fluff will be placed under a RCRA cap, or sent to an off-site landfill and, therefore, will not pose a threat to human health or the environment once the remedial action has been completed. Dioxin is a very large molecule which binds strongly to soil and plastic and has a low potential for leaching to ground water.

Phthalates are present in the fluff because, like lead, they improve the properties of the plastic insulation. The phthalates are closely associated with the fluff material and almost any action which addresses the risk from the lead and PCBs will also address the risk from the phthalates.

Several other metals closely associated with wire processing are present at levels which do not pose a risk to human health, but do pose some risk to the Site ecology. Copper, manganese, zinc and aluminum are present and have been found in the sediments of the small stream which borders the fence line to the south of the Site.

Wind and surface water flows have distributed fluff particles into the on-site soils surrounding the fluff pile. Fortunately, it appears that the fluff is substantially contained within the fenced area. Safe levels of contaminants for soils have been set and because the contaminants are not very mobile, it will be easy to use heavy equipment to scrape the shallow surface layers until the contaminated soil is removed. Contaminated shallow soils will be combined with the fluff and addressed as part of the fluff pile remedial action. Wire debris can be seen outside of the fenced area near the Site gate, and this material will need to be consolidated with debris from within the fenced area during the remedial action. Contaminated soils from this area will also need to be consolidated with the fluff.

Ground water flows generally follow the Site topography which is toward the center of the site from the high ground to the north and south of the site and then generally toward the west to the little Schuylkill River (Figures 4 and 5). The bedrock aquifer is a Class 2a aquifer and is used in the area for some residential wells upgradient of the site. The Hometown area is supplied with drinking water from an upstream reservoir. No residential well or municipal well contamination has ever been detected during the last two decades of study. Ground water is very close to the surface in some areas of the fluff pile, and a small stream crossed the Site before it was covered by the fluff pile. Trenches on the perimeter of the fluff pile divert much of the surface water flows around the fluff pile. Any on-site containment action would need to divert surface and shallow ground water around the containment area. Since ground water has already been addressed in previous RODs, the ground water background will not be discussed in detail.

The small stream outside of the southern fence line (Figure 2) has been contaminated by fluff particles and metals. The first ROD for the Site required removal of sediment contamination by an unspecified method. The performance standard was removal of visible fluff. Tests of a vacuum method were conducted and were not successful. The vacuum hose continually plugged up with gravel and cobbles. This vacuum method has worked well at EPA sites in tidal areas with fine- grained sediments, but has not worked well in forested streams with gravel and cobbles. The stream is surrounded by a very healthy and attractive stream vegetation, including very large and healthy rhododendrons. To vacuum the length of the stream it would be necessary to cut down trees and shrubs all along the stream to make access for a vacuum truck. It would be less intrusive and would do less damage to the ecosystem, if a small excavator traveled down the strewn bed removing soils and large stones which could then be washed and replaced. This action will be implemented after the cap is installed. In the event of a substantial release of fluff during construction, the remedial action contingency plan will address interim remedial measures.

EPA's CONCEPTUAL SITE MODEL

EPA's conceptual model of the site considered all of the key mechanisms for transport and exposure. The exposed mountainous fluff pile is located in a shallow ravine which slopes from east to west towards the Little Schuylkill River. To the north, south and west are thick trees and brush which have helped limit wind dispersion of fine fluff particles. Surface water runoff flows towards the west and the little Schuylkill river. Most of the runon/runoff is collected and carried to a stormwater impoundment at the western end of the Site. Surface water from the forested onsite area to the south of the fence is drained by a tributary of the Little Schuylkill River. Low levels of contaminants have leached into the very shallow overburden ground water at the Site. The very shallow contaminated ground water and leachate flow westward towards the Little Schuylkill River. A leachate treatment and collection system is located at the western end of the site which treats the leachate before discharging it to the unnamed tributary. The deep ground water also flows westward toward the Little Schuylkill River. EPA issued a "No Action" ROD in 1993 because this deep aquifer had not been significantly impacted by Site related contaminants. There are no residential or public wells between the Site and the Little Schuylkill River. Both shallow and deep ground water are expected to discharge into the Little Schuylkill River.

Air Pathway: Although this Site does contain moderately high levels of lead, it is very different from a typical foundry type site. There was never an active air emissions source, and the lead present is highly associated with the plastic chips which are also generally sand- sized particles rather than a dust. The topography and the surrounding trees also help limit air dispersion of contaminants.

There is an odor associated with the pile which is reminiscent of "new car" smell. This smell is probably due to phthalates in the plastics which do have a moderate volatility. Some air sampling was conducted which did not indicate an air pathway problem. Additionally, modeling was conducted after the FS to determine whether the phthalate concentration would pose an air risk. The modeling indicated that phthalate concentrations were well within safe limits even at the Site.

Ground Water Pathway: The deep ground water did not contain Site contaminants, and there are no wells between the Site and the Little Schuylkill River. The shallow ground water and leachate are collected and treated before discharge to the intermittent stream and eventually to the Little Schuylkill River. Since there are no human receptors between the Site and since the land between the Site and the Little Schuylkill River is a State Gamelands, there is no credible significant risk to human health from shallow or deep ground water.

Direct Contact: The Site is fenced and secured when operations and maintenance personnel are not present. The Site is adjacent to an industrial park and bordered on the northern side by Conrail tracks. Therefore under the current land use there are no homes adjacent to the Site with young children. This makes trespassing unlikely, but not impossible. Lead levels are unacceptably high and the current levels of dioxins in the dioxin removal area would produce an unacceptable risk to children playing in the area. The cap system will remove access to Site contaminants which are relatively immobile and pose little risk to ground water.

Surface Water Pathway: Surface water does not contain levels of contamination which would pose a risk to human health under any reasonable exposure scenario. Surface water and sediment may pose a risk to ecological receptors in the onsite stream. After the remedial action is completed, the stream sediments will be excavated as required by a previous ROD and the cap system, relocated leachate collection system and stormwater controls will reduce the risk to ecological receptors in the State Gamelands.

In Summary: EPA's conceptual model is that the exposure pathway posing a significant risk to human health and the environment is from direct contact with the waste and adjacent soils and stream sediments containing particles of this waste.

VI. CURRENT AND FUTURE LAND AND RESOURCE USE

Figure 3 shows the current land use at the site. To the south and east of the site is an industrial park for light industry. To the west of the site are state gamelands and the Little Schuylkill River. To the north of the site are Conrail tracks, and beyond that undeveloped property with one home which is zoned residential. EPA is unaware of any plans to further develop or subdivide the property to the north of the site. The area at the eastern end of the fenced Superfund Site is relatively flat and will be cleaned up to allow for a commercial or industrial facility to be developed in the area expected to be about three to four acres. The capped area will be fenced and land use restricted to protect the cap system. The soil cleanup levels will be protective of workers or although unlikely, any trespasser who might access the Site.

As previously explained, the current ground water and surface water are not used as a water supply. A dam upstream of the Little Schuylkill River supplies water for Tamaqua and Hometown. Ground water and surface water from the Site follow topography and drain or discharge into the Little Schuylkill River. Residential wells are upgradient from this Site which is located adjacent to an industrial park.

VII. SUMMARY OF SITE RISKS

The principal threat posed by the Site was the area of the fluff pile contaminated with high levels of dioxin. EPA guidance defines "Principal Threats" as hazardous constituents which have a concentration posing a risk two orders of magnitude (one hundred times) above safe levels. These high levels of dioxin contaminated fluff were removed from the site as a highest priority remedial action. Lower level current threats to human health and the environment are posed by moderately contaminated fluff and soils which contain dioxin, PCBs, phthalates, lead, copper and zinc. Contaminated, sediments and surface water in the intermittent stream pose a low level threat to the aquatic ecology at the Site and in the State Gamelands. Lower-level threats also include the remainder of the fluff material which has been classified as a hazardous waste, due to its lead content and Toxicity Characteristic Leaching Procedure ("TCLP") results.

Potential human exposure pathways for Site contaminants evaluated in the RA include inhalation of contaminated dust; dermal contact and incidental ingestion of contaminated soils and fluff; dermal contact and incidental ingestion of surface water; dermal contact with leachate (for children); and ingestion, dermal contact, and/or inhalation of contaminated ground water. Exposure to Site contaminants via these pathways would pose an unacceptable health risk to children and adults in the local area. Exposure scenarios considered in the RA very conservatively assumed the absence of the existing fence at the Site, which currently prohibits public entrance, and, for ground water, assumed the presence of a hypothetical downgradient well, which would most likely never exist because downgradient lands are State Game Lands.

The actual risk pathways driving the risk at the Site under realistic current and future use scenarios are dermal contact and ingestion. The carcinogenic risk under these exposure scenarios is primarily due to PCBs and dioxins. The systemic human health risk driver is lead. The primary ecological risk driver for aquatic life in the intermittent stream is zinc in leachate, which is being addressed by an onsite treatment system. The contaminants in fluff pose a contact risk to animals visiting the Site.

A. Human Health Risks

The original RA for the Site was prepared by Environmental Resource Management (“ERM”), and was completed in 1990. The RA was used as the basis for the selection of the recycling remedy under the July 7, 1992 ROD. After the recycling remedy effort was abandoned due to regulatory constraints and lack of a viable market, EPA chose not to revisit the RA. All of the fluff was shown to be above EPA’s trigger levels to take action. A new RA would still be primarily based on the original RI data. The new PCB and lead data acquired during the remedial design, combined with calculations consistent with the current RA Guidance, might have made some minor changes in the baseline risk numbers. However, the changes would have little impact on the selection of an appropriate remedial action. Instead of developing a new RA, the EPA Site toxicologist reviewed the 1990 RA and concluded that the numbers might be somewhat changed if the current RA methods were used, but the overall baseline RA was still valid. The detailed tables from the risk section of the original OU3 ROD for the fluff pile are contained in **Appendix III**. This appendix contains the detailed risk tables, including exposure point concentrations and the resultant risk under different scenarios. Additional data collected during the abandoned recycling design effort has been placed in the Administrative Record and is summarized in this ROD.

The following gives an overview of the major Site contaminants and hazardous substances at the EDM Site:

1) Lead Levels
    Very strongly associated with fluff-not mobile-leachate lead levels about 10-100 ppb
    Lead levels in fluff-mean -3,000 to 11,000 ppm
    Lead levels in soil 1,920 ppm max

2) Dioxins - fluff cleanup level already set at 20 ppb.
    Soil concentrations in RI ranged from 3-7 ppb
    EPA’s Remedial Cleanup Policy is 5-20 ppb for Commercial/Industrial Exposure
    More recent soil samples showed lower dioxin levels
    Site is in an industrial park-background may be elevated.

3) PCBs
    Substantial confusion in the past due to analytical problems in PCB analysis during RI
    Fluff Avg. 20-60 ppm in detailed design studies
    Fluff Range was 15-125 ppm
    Soils RI average was 37 ppm, with max 240 ppm *** But results are very suspect due to analytical problem of confusion with polychlorinated naphthalenes and other compounds. More recent samples showed much lower PCB levels.

4) Other Compounds of Interest (COI) in soils
    Manganese - 365 ppm avg, avg HI = .0004, max HI = 0.001 (See HI definition below)
    Copper - 12 ppm avg, HI = 0.04, max HI = 0.7
    Zinc - 377 ppm avg, HI = 0.0009, max HI = 0.001
    DEHP - 1470 ppm, HI = 0.009, max HI = 0.04

Since the baseline risk clearly justified taking remedial action, the most important risk consideration became risk-based cleanup levels. EPA could justify taking action on any of the following risk “triggers”: 1) Waste fails the TCLP test for lead; 2) PCBs above 50 ppm in the fluff; 3) Overall risk from dioxin, PCBs and phthalates,; 4) and/or Lead above industrial cleanup level. Once the Site is remediated to the risk- based cleanup levels, the exact numbers in the 1990 baseline RA will be irrelevant, since the risks will have been reduced to safe levels. The Site toxicologist has furnished the EPA Remedial Project

Manager with the risk from Site contaminants at various concentrations. The actual cleanup contaminant concentrations selected are a risk management decision.

The National Contingency Plan ("NCP") establishes acceptable levels of carcinogenic risk for **SUPERFUND** sites at between one in 10,000 and one in 1 million additional cancer cases. Expressed as a **scientific notation**, this translates to an acceptable risk range of between 1 x 10-4 and 1 x 10-6 over a defined period of exposure to contaminants at a Site.

This means that one additional person per 10,000 or one additional person in 1 million, respectively, could develop cancer given a lifetime (70 years) of exposure to contaminants at a Site.

The contribution from the Site to maximum lifetime carcinogenic risks for adults and children is 2.05 x 10-4 (2 additional cancer cases per 10,000 adults exposed) and 7.17 x 10-4 (7 additional cancer cases per 10,000 children exposed), respectively. These are unacceptable carcinogenic risks. The overall risk result of the 1990 RA for adults and children was 9.44 x 10-4

The original RA also determined that it was necessary to remediate the sediments in the stream to the south of the Site. The contaminants in the sediments were the same as those found in the fluff, and contamination is primarily due to the actual presence of fluff in the stream sediments. The first ROD for the Site selected removal of sediments from this stream, but this remedial action has not yet taken place.

In addition to carcinogenic risks, the baseline RA calculates risks to humans of contracting other, non-carcinogenic health effects from substances associated with a Site. This calculation, known as the **"Hazard Index (HI),"** is made by dividing the human exposure estimates associated with a Site, by exposure levels that are determined by EPA to be acceptable. Any result of this calculation that is greater than 1.0 may be considered to present an unacceptable risk. The ratios are added to represent exposures to multiple contaminants. The Hazard Index for the Site is greater than 1.0 for children using a very conservative theoretical scenario which assumes fugitive emissions, residential use of a non- existent downgradient well and other possible but unlikely exposures (Hazard indices were in the unacceptable range of 1.31 to 10.6). Actual exposure scenarios produced hazard index risks that ranged from 0.05 to 1.1.

In addition to the actual site specific risk calculations, there are several risk related concentration levels of contaminants which usually require EPA to take remedial action. As stated above, the average lead level in the fluff is between 3,000 and 11,000 ppm. EPA generally remediates lead levels above 1000 ppm for commercial and industrial settings. The average level of PCBs in the fluff is just above 50 ppm, which requires action under the Toxic Substances Control Act (TSCA). In summary, the fluff pile would require remediation for any of the above reasons - carcinogenic risk, systemic risk, lead or PCB concentrations.

B. Ecological Risks

An ecological assessment was conducted in 1989 and a report issued on 1/5/90, which was revised and reissued on 2/28/91. Ecological receptors are present as aquatic life in the stream to the south of the fluff pile. The stream is just outside of the fenced area and leads to the Little Schuylkill River. The first ROD for the Site addressed the risk to the stream by requiring removal of contaminated sediments. This activity will begin after the caps system is installed to avoid remediating the stream twice, since during the capping activity, some fluff particles will almost certainly find their way to the stream. Every effort will be made to minimize contamination, but because the fluff pile will need to be regraded and managed, some stream contamination will be unavoidable. This ROD will primarily affect the terrestrial community. A description of this community taken from the 1991 Ecological Assessment follows :

The major ecosystem of the EDM Site and surrounding ridges is the eastern deciduous forest. The site and surrounding area are transition zones between the mixed oak and northern hardwood forests. The original forest was almost completely harvested by 1900, for fuel and by the mining industry. The present forest is a second growth forest. The plants and animals associated with these forest types are common in the region.

The local ecology can generally be divided into three classifications, terrestrial, wetland and aquatic. The terrestrial community is composed of plants and animals inhabiting the drier, upland areas of the site.

The wetland community is limited to the small floodplain of the intermittent stream and the little Schuylkill River and several small emergent wetland areas. All of these wetland areas except one small emergent wetland, are located outside of the fenced Superfund area (See Figure 2). The aquatic community exists in the intermittent stream and the little Schuylkill River.

The upland plant community near the Site is a mixed hardwood forest consisting mainly of oaks, maples, with some pines and hemlocks. Other plants common to the area include: mountain laurel, blueberry, asters, grasses and dogbane.

The most abundant large mammal existing near the site is the white-tailed deer. Black bear have also been observed in the area. Other mammals which may exist near the Site are: porcupine, cottontail rabbits, showshoe hare, fox, mink, raccoon, gray squirrel, rock vole, and several other rodents. Bird life consists of migratory birds and year round forest species such as wild turkey and ruffed grouse. The Site is located along a migratory route and a variety of songbirds and raptors may visit the area. Raptors such as the red-tailed hawk, broad wing hawks, kestrels, and great-horned owls may use the preferred habitat near the area. (State Gamelands)

Rare or Endangered Species

No rare or endangered species have been reported or observed near the site, but the following species may be present in the forested region near the Site:

Species	Classification	Habitat
Forked clubtail dragonfly	U	Wetlands
Canadian White-faced skimmer dragonfly	U	Wetlands
Timber rattlesnake	V	Forest
Red-headed woodpecker	V	Forest
Bluebird	V	Forest edges
Snowshoe Hare	V	Forest
Rock vole	V	Forest
River Otter	V	Wetlands
Bobcat	V	Forest
Water shrew	U	Wetlands
Coyote	U	Forest
Eastern pearlshell	U	Aquatic

U - denotes the status is undetermined. The species may be of special concern, but there are insufficient data available to provide an adequate basis for classification.
V - denotes vulnerable, the species is not currently endangered or threatened, but may become so.

Note: The sections on aquatic life and surface water have been skipped since these risks have already been addressed by a previous ROD.

Field Assessment

On November 1989, three members of ERM’s ecological assessment staff(senior and project biologists) visited the EDM Site in Schuylkill County, Pennsylvania. A reconnaissance of the Site’s wildlife, vegetation, and wetland areas was conducted in the morning while an aquatic biology survey of adjacent sections of the Little Schuylkill River and a small unnamed tributary was conducted in the afternoon.

The Site and adjacent areas were also investigated for the presence of any unique habitats, historic sites, and areas of archeological significance. The findings and observations noted during the field assessment are detailed below.

Wildlife

Wildlife appeared to be plentiful in areas outside the fenced Site. Visual sightings and life-signs (i.e. Tracks, droppings, and nests) were among the methods of wildlife identification employed. Wildlife identified during the Site visit included: White-tailed deer, gray squirrel, marsh hawk, and various songbirds. Domestic goats were also observed near the northwestern property boundary. The free-roaming goats were from a nearby farm just to the north of the Site.

No wildlife, domestic animals, or life-signs were observed within the fence. Small animals could access the Site at various spaces (6-12") under the fence. The fence appears to restrict large animals from the Site.

Although wildlife may visit the site, due to the lack of cover, water and food on the Site the surrounding woods are much more attractive to wildlife.

Vegetation

Trees: Gray birch, Red oak, White oak, Pitch pine, Sassafras, Black cherry, Eastern hemlock, Red maple, Yellow birch, Chestnut oak, Black locust, and Staghom sumac.

Shrubs/vines: Mountain laurel, Green brier, Low-bush blueberry, Sweet fern, Wild grapes, Multiflora rose, and Japanese honeysuckle.

Herbs: Ferns, Mosses, Princess-pine, Wintergreen.

The majority of the area within the fence is devoid of vegetation. However, small patches of vegetation exist along some sections of the fence. This vegetation predominantly includes pioneer species such as gray birch, black locust, black cherry, quaking aspen and sweet fern.

Two small patches of woodland exist near the eastern and southern fencelines and are similar in species composition to the surrounding area. These woodland patches are very small in area, the eastern area is approximately 150 feet by 57 feet, and the southern area is approximately 500 feet by 50 feet.

There was no indication that vegetation either onsite or offsite was stressed due to Site contamination.

Conclusions (Terrestrial Community Only): The EDM Site is separated from the surrounding forest by a chain link fence. The forest closely approaches the fence and there is not a clear transition zone between the fence and the forest edge.

The plant community existing onsite is very sparse, and consists of hardy pioneer species. Immature aspens are the most common trees on the site, existing as small islands. The lack of an established plant community discourages wildlife from utilizing the area. Since the Site is fenced, large mammals are prevented from easily entering the site. Offsite erosion occurs, potentially carrying some compounds into the forested areas, but these areas are not high quality hunting grounds for most raptors.

Current Conditions

While the basic description of the site in the above ecological assessment is still accurate, ten years have passed since the ecological assessment. The fluff pile occupies much of the site and there has been little growth on the actual fluff material. Some of the perimeter areas outside of the pile have seen increased vegetative growth, however, the areas outside of the fence are still much more attractive to wildlife. Deer have been observed in the fenced area on occasion, and swallows may have nested in the fluff pile.

The installation of the cap will prevent contact with the waste and will provide grassy habitat over the extent of the cap. Additionally, over time, the surface water diversion trenches which collect runoff from the cap will provide some additional wetlands habitat. Soils above cleanup levels will be excavated and placed under the cap system along with the fluff. Some of the soil cleanup levels were set based on ecological considerations.

Among the risks to the environment posed by the Site are: copper, lead and zinc contaminated sediments and surface water in the intermittent stream which runs along the southern boundary of the Site. Copper and zinc cleanup levels were set appropriately to provide protection of aquatic life even if some future erosion were to transport some surface soils into the sediments of the stream adjacent to the site. Potential sources of contamination are the leachate seeps emanating from the stream bank, the fluff pile, the shallow ground water discharge and the surface runoff from the fluff pile.

Cleanup Levels for Human Health and the Environment

It is the EPA’s (lead agency) judgement that the Selected remedy identified in this

Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare from actual or threatened releases of hazardous substances, pollutants or contaminants into the environment. The following risk-based cleanup levels, in conjunction with Site fencing, institutional controls and property access controls, will protect human health and the environment at the Site. EPA also believes that the risk levels listed below will adequately protect the surrounding ecology:

Constituent	**Soil Cleanup Level**	**Risk at Cleanup Level**	**Hazard Index at Cleanup Level**
Manganese	1,000 mg/kg		0.006
Copper	270 mg/kg		0.007
Zinc	400 mg/kg		0.002
DEHP bis (2-ethyhexyl) phthalate	100 mg/kg	0.2E-05	0.10
PCBs	10 mg/kg	1.4E-05	
Dioxins	0.50 ug/kg	3.5E-05	
Total Risk or HI		**5.1E-05**	**0.12**

The lead soil cleanup level will be 400 ppm. Lead contact risks are calculated differently than the other metals which focus on the damage to organs. The acceptable lead level is based on the risk to the intelligence of infants and developing children. The resulting safe lead levels are much lower than if they were developed based on damage to organs. The mathematical basis is different and lead is not added to the aggregate Hazard Index. The best available quantitative tool for evaluating health effects from exposure to lead is the Integrated Exposure Uptake Biokinetic (IEUBK) model (EPA 1994a). This model uses current information on the uptake of lead following exposure from different routes, the distribution of lead among various internal body compartments, and the excretion of lead, to predict impacts of lead exposure on blood lead concentrations in young children. The predicted blood lead concentrations can then be compared with target blood lead concentrations associated with subtle neurological effects in children. Because children are thought to be most susceptible to the adverse effects of lead, protection for this age group is assumed to also protect older individuals. Protection of young children is considered achieved if exposure is such that a typical or hypothetical child or group of similarly exposed children would have an estimated risk of no more than 5 percent of exceeding the 10 g/dL blood lead level (EPA 1994a).

Basis for cleanup levels of each compound:

DIOXIN: EPA’s "Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites," OSWER Directive 9200.4-26, April 13, 1998, was taken into consideration in developing preliminary soil remediation goals for dioxin. As documented in the Administrative Record, a preliminary remediation goal of 5 ppb (TEQs) is generally selected for soil at a Site for areas reasonably expected to be used as industrial property. This soil cleanup level of 5 ppb (TEQ) was reduced to 0.50 ppb for the Site based on EPA’s site aggregate site specific risk range, ecological risk concerns and community concerns. This level is below the Commonwealth of Pennsylvania’s Land Recycling ACT II Medium Specific Concentration (MSC) for a site-specific contact risk cleanup level which is 0.53 ppb and this standard was considered in EPA decision to reduce the dioxin cleanup level. The new site-specific soil cleanup level of 0.50 ppb dioxin (TEQ) for industrial soil at the Site is considered protective (as documented in the Administrative Record) for human health and the environment, based on current and future use of the Site for industrial purposes, and reflects an excess cancer risk of 3.5 x 10-5 for dioxin which is closer to the mid-range of EPA’s acceptable risk range.

Lead: In this ROD, the lead cleanup level will be 400 ppm, which was reduced from the 1000 ppm level in the Proposed Plan, which was based on EPA’s policy for lead in soil at commercial/industrial sites. This policy level was set based on risk and other considerations. A site-specific human health risk calculation using the Adult Lead Model showed that a lead cleanup level of 1200 ppm would be protective. However, due to the presence of multiple contaminants, broad community concerns expressed by the public and elected officials over the capping alternative and long term reliability of the remedy, EPA chose a 400 ppm cleanup level which would be safe even in the unlikely event of children playing in the soils. Although EPA could not justify treating and sending the waste offsite, EPA seeks to increase the public acceptance of the remedial action by selecting conservative soil cleanup levels. Based on limited soil profile studies which showed that lead had not migrated deeply into the soil, this lower cleanup level should be achievable at very little incremental cost.

PCBs: EPA chose a 10 ppm cleanup level for PCBs based on EPA policy for PCB cleanups at industrial sites and an acceptable aggregate risk after the Site cleanup.

Manganese: Manganese had a negligible risk to human health from contact even at very high levels. The cleanup level for manganese was selected after considering the following site specific factors: 1) The Biological Technical Assistance Group (“BTAG”) has a soil screening value of 330 ppm for safe levels of manganese in soils to protect the ecology. One source on background levels in soils (Shields 1988) gives the average level of manganese in soils as 600 ppm, with a range in soils between 100 and 4,000 ppm. Other sources give similar levels. A level of 1,000 ppm was acceptable to the BTAG and will be used as the soil cleanup level.

Copper: Like manganese, copper had a negligible risk to human health from contact, even at very high levels. However, aquatic life is very sensitive to copper, and at higher levels, copper can be toxic to plants (phytotoxicity). Copper levels in urban gardens range between 3 ppm and 140 ppm. Copper in sewage sludges ranges between 50 ppm and 3,300 ppm. Fertilizers can contain between 1 and 300 ppm copper. The Effects Range Moderate (ER-M) from a Long and MacDonald study gave a safe level of 270 ppm copper. Although this cleanup level is for soils, rather than sediments, eroding site soils could produce sediments in the future close to this level. By using a 270 ppm cleanup level, EPA believes there will be no negative impact on the stream in the future due to copper contamination.

Zinc: Zinc also poses a negligible risk to human health from contact, and is even taken as a vitamin supplement. Like copper, zinc is toxic to aquatic life and at high levels can also be phytotoxic. Zinc in urban gardens and orchards can range from 20-1200 ppm The ER-M for zinc in sediment is 410 ppm. EPA set a cleanup level of 400 ppm which will be protective of the adjacent stream and should avoid any phytotoxic effects on terrestrial plants.

bis-(2-ethylhexyl) phthalate (DEHP): Phthalates have been widely used as plasticizers and are ubiquitous contaminants in the environment. Because plastics are used in analytical labs, phthalates are often detected as false positives. In lieu of site-specific ecologically based cleanup values, a conservative cleanup goal of 100 ppm was recommended based on the available information for phthates. EPA reduced the level contained in the Proposed Plan (500 ppm) to 100 ppm as the soil cleanup level for DEHP in surface soils. EPA reduced this level based on the BTAGs recommendation and the public concerns about the ecology, especially the little Schuylkill River. This lower level also contributed to an overall aggregate carcinogenic risk closer to the middle of EPA’s acceptable risk range, which had been closer to EPA’s upper bound on acceptable risk.

VIII. REMEDIAL ACTION OBJECTIVES

The primary remedial action objective for this operable unit is to prevent contact with the fluff pile and contaminated soils at the EDM Site including dermal exposure, ingestion and wind borne inhalation of fluff related contaminants. A secondary benefit is prevention of the leaching of contaminants into the shallow ground water and elimination of surface water runoff carrying fluff particles into the stream to the south of the Site fence. A result will be the reduction or elimination of leachate, which is currently treated and discharged into the stream to the south of the Site, which leads to the Little Schuylkill River. If possible, a minor goal is the creation of a clean, level area of the Site, which could be a factor in the community acceptance of this remedy, since it would provide the possibility of beneficial re-use of the property.

The dioxin soil cleanup level of 0.5 ppb was established based on the following factors: a) site-specific risk; b) strong public concerns; c) EPA policy for dioxin and d) PADEP's ACT II cleanup level. The PCB soil cleanup level of 10 ppm is based on EPA policy for PCBs in an industrial exposure setting. Because there are multiple carcinogens in site soils such as phthalates and PCBs, EPA chose a dioxin cleanup level low enough to give an aggregate risk below 1x10-4. EPA also considered the fact that the PCBs are bound in the plastic particles and are not very bio-available, or leachable. The lead cleanup level was also set based on EPA's policy for lead cleanups in a commercial industrial setting. Site specific calculations showed that a lead level of 1200 ppm would be acceptable for industrial use and exposure of workers, but because there are other inorganic contaminants, and widespread public concerns, EPA chose a more stringent cleanup level for soils surrounding the cap (cleanup level of 400 ppm) that would be safe even for unrestricted use. EPA expects this lower level to add minimal cost to the overall remedial action. This is because profiling samples indicate that lead has not migrated far into the soil and thus, the depth of the soil excavation will be relatively shallow and only a minor incremental expense should result. Moreover, the lead is roughly correlated with the PVC and phthalate content in the soil, and it is the PVC and phthalate concentrations which will determine the depth of the excavation. The limited data suggests that if the new lower phthalate cleanup level of 100 ppm is achieved, lead concentrations in soils should be generally below 400 ppm. This profiling data is discussed in a memo to the EDM file titled: "Contaminant Migration in Site Soil Samples" from Frank Vavra dated 5/8/01. In light of specific concerns expressed by the Commonwealth of Pennsylvania, EPA chose this lead clean-up standard which is lower than what EPA typically provides for at other lead sites. Community acceptance was also a major factor in this change to the new lead cleanup level, consistent with the nine evaluation criteria set forth in the NCP at 40 C.F.R. Section 300.430(e)(9).

IX. DESCRIPTION OF ALTERNATIVES

Note: The time to implement a remedy listed below is the time required to complete the construction of the remedial action from the time it begins. Typically nine months to one year is required to negotiate an agreement with a Responsible Party to conduct the work and an additional year or more is needed to design the remedial action.

No Action Alternative

A "No Action" Alternative was evaluated as a baseline, as required by CERCLA. EPA determined that this alternative was not protective and, therefore, it was rejected. No further analysis of this alternative was conducted.

Alternative 1 - ROD Recycling Remedy

Alternative 1 describes the recycling remedy selected in the July 1992 ROD for OU3. This remedy entails recycling the fluff, in either bulk, or as separated components. Bulk recycling would result in a product that would retain the same concentration of contaminants as the raw fluff. Thus, PCBs in a bulk recycled product would also exceed the

TSCA limit of 2 ppm PCBs for return-to-commerce. Bulk recycling is, therefore, infeasible and the following discussion explains in more detail why this Alternative is not viable.

Separation technologies have been implemented on samples of the fluff in multiple pilot studies to evaluate the feasibility of separating recyclable fractions intermixed in the fluff pile. These pilot studies have achieved success in separating large debris from plastics and metals. However, the ultimate viability of the recycling alternative is driven by the attainment of threshold requirements. As noted above, both the PVC and PE have PCB concentrations above the TSCA limit for return-to-commerce, even after washing of PE. Additionally, the purity of PVC and PE are not at high enough levels to be readily accepted into the recycling market. A large quantity of the fluff pile (up to 60%) would still require off-site disposal of non-recyclable fractions.

Based on the level of PCBs in the recovered fluff pile fractions, and the ineffectiveness of washing technologies to remove the PCBs below TSCA "return to commerce" concentrations (2 ppm), the recycling alternative is not a viable remedial alternative. In addition to the PCB contamination issue, there are concerns regarding the purity of recovered material, as well as the market demand and acceptance of potentially recovered fluff pile fractions. The plastic in the fluff pile has been exposed to the elements and sunshine for many years which degrades plastic. The quality of the plastic is therefore low, and the stigma of waste originating at a Superfund Site may cause potential purchasers liability concerns. EPA and the Respondent have agreed that recycling is not a viable alternative for the fluff, due to the inability to comply with required off-site regulations.

Alternative 2 - On-Site Stabilization and Off-Site Disposal

Total Capital Cost	$23,169,000
Average Annual O&M	$ 98,300
Total Present Worth	$24,680,000
Time to Implement	18 months

This alternative generally consists of in-situ stabilization of the fluff prior to off-site transportation and disposal, specifically to reduce the solubility of lead sufficiently so that the fluff passes the TCLP test. This means that the fluff would be chemically treated to convert the lead present on the surface to an insoluble form. Once the fluff passes the TCLP test, the stabilized fluff could then be disposed of at an off-site landfill as non-hazardous waste, except for the presence of PCBs. Although the fluff is regulated under TSCA, the June 29, 1998 PCB rule provides for disposal of plastic insulation from wire or cable in non-TSCA solid waste disposal facilities. However, if the fluff were stabilized on-Site, using an ex-situ treatment process, or off-site at a hazardous waste facility, the fluff would be required to satisfy applicable Land Disposal Regulations ("LDRs"). The Phase IV LDRs require that the total PCBs be reduced to 10 ppm in the fluff, which is not possible, and would require a waiver of the regulation from EPA. Concentrations of total PCBs vary throughout the pile, but are generally close to the TSCA-regulated level of 50 ppm. Even if both the TSCA and RCRA regulations are satisfied, disposal in a municipal landfill would also require acceptance by the disposal facility and approval by the state where the disposal facility is located. Most solid waste landfills in Pennsylvania are not allowed to accept waste with PCBs above 25 ppm. These landfills would have to apply for a permit modification which would require a public hearing potentially producing substantial project delays.

To avoid triggering the RCRA LDRs, in-situ stabilization of the fluff could be performed by iterations of spraying of a stabilizing agent on the fluff, followed by excavation of the stabilized layer. Another stabilizing method would consist of injection of the stabilizing chemicals and mixing by augering or similar means. Ex-situ stabilization of the fluff could be performed by conveyance through a spray of the stabilization agent, bulk mixing, or similar means. Proven stabilization agents consist of pozzolanic material (e.g., portland cement, flyash, cement kiln dust, etc.) or phosphate mineralization. This FFS and the associated detailed cost estimates assume phosphate mineralization stabilization of the OU3 material. Phosphate mineralization is superior to pozzolanic stabilization because a minimal volume increase (5%) occurs with phosphate mineralization. The pozzolanic stabilization requires much more treatment materials and a correspondingly large volume increase resulting in much higher disposal costs.

One treatability study investigated the effects of phosphate mineralization using the MAECTITE process on the fluff material. This process is a geochemical fixation reaction of leachable metals into stable mixed mineral forms of the apatite and barite and mixed forms of these minerals. These minerals, especially the mixed substituted apatites, are extremely resistant to leaching under any of the probable environmental conditions and remain stable in pH conditions ranging between 2 and 12.

This alternative could be completed within 18 months from the start of mobilization. However, this aggressive schedule is heavily dependent on the ability of the disposal facility(ies) to obtain a major permit modification in a timely fashion to be able to accept PCBs, and to have the disposal capacity (total and daily) to accept the 750 tons per day required in the one year period.

It would not be possible to treat all of the debris at the Site. Unprocessed wire, metal hardware, etc., would be segregated and stockpiled on the Site for recycling or disposal. Items such as large rocks/boulders and wooden articles (chipped for mulch) would be stockpiled separately on-site, characterized, and utilized as part of the site restoration activities as appropriate, based on characterization results. It would be possible to wash separated debris, rocks and cement inside a bermed, lined depression, with the rinse waters directed to the on-site treatment plant. All nonrecyclable debris and all non-hazardous soil (based on the TCLP test), containing total lead concentrations between 1,000 and 40,000 ppm, could be sent to a municipal or residual waste landfill. Soils and debris which fail the TCLP test for lead would be solidified along with the fluff and sent offsite.

Specific components of Alternative 2, presented in a likely sequence of implementation, include the following:

- Prepare staging area for equipment/operations
- Mobilize equipment and construction of stabilization units
- Stabilize (in-situ) OU3 fluff, soil, etc. material for RCRA characteristic metals and stockpile
- Excavate stabilized material
- Screen/size/segregate fluff pile material
- Sample and analyze stabilized material for disposal criteria
- Load stabilized material into transport containers (trucks or train cars)
- Dispose of stabilized materials in appropriate landfill(s) based on sampling results
- Relocate mounds of mixed soil and wire debris currently outside the site fence to the on-site consolidation area
- Sample and identify contaminated soils outside the footprint of the cap and consolidate for offsite disposal at an appropriate landfill
- Post excavation sampling of soils to verify that performance standards were met
- Restore site with vegetation to prevent erosion of soils.

- Demobilize equipment and dismantle process equipment

Alternative 3a - On-Site Separation and Resource Recovery (Polyethylene) and Off-Site Disposal of Remaining, Stabilized Fluff

Total Capital Cost	$ 32,634,000
Average Annual O&M	$ 136,300
Total Present Worth	$ 34,730,000
Time to Implement	Six years

Alternative 3a evaluates the separation of PE for resource recovery. In addition to the separation of PE, the remaining fluff (primarily PVC) would be stabilized, using an in-situ treatment process to remove the RCRA characteristic for lead and disposed of at a Subtitle D landfill. Non-hazardous soil and debris would also be sent offsite for disposal as under Alternative 2.

Lucent had several different contractors perform recycling studies of the fluff. The MacLeod and Philip fluff studies concluded that PE could be successfully separated from the fluff pile material. The MacLeod pilot study demonstrated that the PE plastic chips could be separated from the ROD plastic chips by pumping a water slurry of the fluff through a hydrocyclone and sink/float tank where the material is separated into components based on specific gravity and removed with screw augers. The Phillip's study evaluated an electrostatic process to remove metals, followed by a plastics separation phase. The plastics separation process consists of size classification, washing, density separation and drying. Based on the treatability studies, approximately 26% of the Fluff consists of recoverable PE. The 26% mass translates into 35,000 tons of PE based on the estimated 136,000 tons (dry weight) of the fluff. A combination of the data generated during the investigation of the fluff components indicate that the PE fraction contains 3 to 5 ppm of TCLP lead and total PCB concentrations of approximately 20 ppm. Because lead concentrations in the leachate from the TCLP test are close to the 5 ppm level which determines whether the

- Load separated PE into transport containers/ trucks/ train cars
- transport separated PE to WTE facility
- Transport stabilized fluff to disposal facility
- Consolidate mounds of mixed soil and wire debris with contaminated soil for offsite disposal

Alternative 3 b - On-Site Separation and Resource Recovery (Copper), and Off-Site Disposal

Total Capital Cost	$ 26,385,000
Average Annual O&M	$ 79,200
Total Present Worth	$ 27,968,000
Time to Implement	24 months

Alternative 3b specifically considers the separation of residual copper for recycling. In addition to the separation of copper, the remaining fluff pile material would be stabilized using an in situ treatment process (as described in Alternative 2) for lead, and would be disposed of at a Subtitle D landfill. The non-hazardous soil and debris would be consolidated and disposed of as discussed under Alternative 2.

The estimated percentage of total metals in the fluff is 6%, and consists primarily of aluminum and copper. This estimate of metal content is based on analytical data of total metals found in the raw fluff samples, and does not represent the recoverable metal content which is substantially reduced because of wire embedded in plastic, oxidized metal, fine dust, etc. Following treatability studies, it was determined that aluminum was not of sufficient quality to warrant recovery. Several studies were conducted, but the

Sevenson copper recovery process was the most promising.

The Phillip/Waxman study utilized an electrostatic separation process which included size classification, debris removal, drying, aspiration and electrostatic separation. The Phillip Waxman process was able to separate out a metal stream equivalent to approximately 3% of processed fluff material on a dry weight basis. A metal assay performed on the separated metal stream (3%) determined that only 43.9% of the 3% metal stream was actually metal, of which 63.8% was aluminum and 34% was copper. These results give an actual usable metal yield on less than 0.5% recoverable copper in the fluff material using the Phillip/ Waxman process. This process would take twenty five years to complete the metal separation for the entire fluff pile.

The Sevenson process was a complicated multi-stage separation process to remove the fluff from the metals and to separate copper and aluminum. The Sevenson copper separation process, as presented in Section 1.4.4 of the FFS, predicts that 1.5% of the fluff is recoverable copper. The copper recovered would be in the form of a 30% copper concentrate which would be sold to an off-site copper recovery facility for further processing. The processing rate is estimated at 600 tons per day, which equates to approximately one (1) year, to process the fluff assuming 24 hours a day processing. PCB analysis of the copper concentrate resulted in total PCBs of approximately 95 ppm, presumably due to the PVC content of the copper concentrate. This PCB level complicates handling of the material. The Sevenson copper separation process thus operates at a rate compatible with the stabilization and disposal process described in Alternative 2. Sevenson determined that the secondary separation process on-site would be cost prohibitive, with additional capital costs of approximately $2.3 million.

Hamos USA (“Hamos”) was also contacted (no fluff samples were provided) to determine if there were other copper recovery processes that could be fully implementable on-site and capable of generating a 90% or greater copper concentrate which would ensure that total PCB concentrations well below 50 ppm. Hamos responded with a 10 ton per year process which included screening, turbomilling (reducing particle size to between 0.1 and 0.2 mm to liberate embedded copper from insulation and remove the oxide and carbonate film on the surface of the copper particles.), followed by electrostatic separation. An optimistic copper recovery estimate of approximately 4% of the fluff material was presented by Hamos. Even if this untested, estimated recovery rate is accurate, the separation process would result in a loss of $84 per hour or $1.5 million over the duration of the project. The actual loss could be much higher and this very complicated processing proposal had the potential for severe processing problems and delayed of project completion. Additionally, the TSCA requires PCBs to be less than 2 ppm in recycled materials. This level of PCBs might not be achieved in all batches processed.

The Sevenson copper recovery process is the most feasible of those evaluated. It is anticipated that the Sevenson copper separation component of Alternative 3b could optimistically be completed in one (1) year from remedy implementation. The stabilization and disposal of the remaining OU3 components would be implemented concurrently with the separation process. Mobilization and Site preparation is expected to require 2 to 4 months, with an additional 3 to 4 months required for: a) treating/ disposing; b) on-site consolidation and disposal of the underlying/perimeter soil and debris; c) soil sampling, demobilization and site stabilization and restoration; and approximately one year of copper separation and fluff pile residual stabilization and disposal. This alternative could be completed within approximately 2 years from implementation.

As with Alternatives 2 and 3a, non- hazardous unprocessed wire, metal hardware, etc., would be segregated and stockpiled on the Site for recycling or disposal.

The details of implementation would depend on the process and remedial design selected and the in-situ stabilization process. In general, the following steps would be required:

- Prepare staging area for equipment/ operations

- Mobilize equipment and construction of the selected separation process and stabilization units

- Stabilize fluff material for RCRA metals

- Excavate stabilized material and screen/ segregate material

- Separate copper concentrate from fluff material in a multi-step process which includes drying to approximately 5% moisture

- Sample remaining fluff material for disposal criteria

- Load copper concentrate into transport containers

- Load remaining fluff into transport containers

- Transport materials to appropriate facilities

- Relocate remaining mounds of mixed soil and wire debris currently located outside of the fence to the on-site consolidation area

- Consolidate non-hazardous soil and debris for shipment to an appropriate facility

- Site restoration with vegetation to prevent erosion and sedimentation.

- Demobilize equipment

Alternative 4 - Direct Current Graphite Arc Melter Technology

While Arc Melter Technology ("AMT") is considered to be potentially feasible, it is not a proven technology. This technology consists of passing large amounts of electric current through soil/waste until the soil/waste melts. The very high temperatures involved decompose organic compounds and produce gases which need to be collected and treated. Extensive research and testing would be required to verify this technology as a viable remedial alternative. By-products resulting from applying AMT to the fluff include: toxic off-gases, including hydrochloric acid ("HCl") from the processing of PVC. The toxic off-gases and HCl would need to be either controlled, recovered, neutralized, or recycled. There are serious concerns regarding implementation of this alternative, due to the limited amount of past processing experience. In addition, the byproducts of this treatment technology may cause difficulty in providing a remedial alternative that is protective of human health and the environment. The high chlorine content of the fluff may produce unacceptable dioxin emissions in off- gases. The energy costs associated with this alternative are also high and this alternative would be extremely expensive. EPA does not consider this alternative to be viable because of the problems detailed above, and because of the large volume of material to be processed. After further analysis, this Alternative was screened out and not evaluated in detail.

Alternative 5 - Landfill Daily Cover

Using the fluff pile material as a landfill's daily cover, as defined under Chapter 273.232 of the Pennsylvania Municipal Waste Regulations, would not meet the performance requirements of the regulations presented in Section 2.3.9 of this FFS. This conclusion is based on discussions with PADEP representatives and landfill personnel, and an evaluation of the physical properties of the fluff and the contaminant levels. After further analysis, this Alternative was screened out and not evaluated in detail.

Alternative 6 - In Place Closure

Total Capital Cost	$ 8,871,000
Average Annual O&M	$ 261,500
Total Present Worth	$ 12,891,000
Time to Implement	12 months

Alternative 6 consists of an on-site containment system for the fluff, debris and soils contaminated above cleanup levels. This alternative constitutes hybrid-landfill closure. Disposal occurred before RCRA and therefore only landfill requirements which are relevant and appropriate are ARARs. This system would include a low-permeability, composite barrier cap; an upgradient surface and ground water diversion/ barrier. The leachate collection system would be moved and the continued downgradient leachate and overburden ground water collection and treatment would continue under the first ROD. The cap design will be for a "RCRA equivalent" multilayered cap (See Figure 6). In order to contain the materials within an engineered cap, fluff would need to be redistributed on the Site in order to establish stable slopes for the cap components. About 42 percent of the fluff would need to be moved and regraded. To minimize slope stability concerns, final side slopes of no more than 4 horizontal to 1 vertical (4H:1V) would be constructed, with a 15 foot wide terrace for every 25 feet of vertical rise. Regrading of the fluff will increase the fluff pile footprint. However, this increase can be managed within the Site boundary (See Figure 7). The entire site is contaminated with fluff and this regrading is within the existing area of contamination and will not trigger the Land Disposal Restriction. In fact when the contaminated soils are excavated and consolidated the footprint of contamination will be smaller than it currently is. Storm water, surface water and leachate controls (i.e., storm water diversions/swales/basins, an upgradient trench for diversion of overburden ground water, and a relocated downgradient collection trench to contain impacted ground water and leachate for treatment) will be implemented to prevent the potential for surface water and ground water infiltration through the fluff. An upgradient ground water diversion trench would be constructed deep enough to intercept overburden ground water which otherwise might infiltrate through the fluff, so that this water would be routed around the fluff pile and directed to the unnamed stream tributary which lies southwest of the Site.

There currently is a leachate collection trench on the downgradient side of the pile to collect water that has infiltrated through the pile material. The collected leachate is conveyed to the Site Treatment Plant (STP) prior to discharge through the NPDES outfall to the unnamed tributary. There is also a ground water trench that collects overburden water downgradient of the leachate collection trench. These existing trenches would be relocated, maintaining an efficient combined collection trench located downgradient of the regraded material as required by the OU1 ROD. All water collected in the new downgradient collection trench would be directed by gravity to the existing STP, which would treat the collected leachate prior to discharge.

The construction of a low-permeability cap, along with an engineered upgradient diversion trench, will greatly reduce the volume of leachate generated and the volume to be collected for treatment. Depending on the volume and quality of the collected leachate, arrangements to pump this water to the municipal treatment plant may be evaluated during the post construction period. Municipal treatment plant acceptance and implementation of a pumping station would decrease the annual O&M costs, and discharge to the unnamed tributary would cease.

In addition, surface water runoff management and erosion/sediment control measures will be constructed and maintained to ensure compliance with applicable and relevant and appropriate regulations. Long-term monitoring and site inspections will be conducted at pre-determined locations and intervals to evaluate changes in Site conditions.

Landfill gas will be managed as required by PA code 25 section 273.171.

Monitoring wells would be required to make sure that contaminants are contained. The exact number and placement will be determined by EPA in consultation with the PADEP during the remedial design. Because hybrid closure is being used, the monitoring well requirements will not have to comply with all sections of RCRA hazardous waste regulations.

Land use restrictions would be implemented to prevent damage to caps and associated structures.

Specific components of this alternative, presented in a likely sequence of implementation, include the following:

- Prepare for equipment/operations
- Mobilize equipment
- upgrade surface water runoff management and erosion and sediment control measures
- Construct upgradient diversion trench
- Relocate the downgradient collection channel by constructing a deeper and perhaps longer trench with a low permeability lining
- Regrade fluff pile
- Consolidate with the graded pile, any visual fluff, mixed wire and soil mounds outside the fence, and soils with contamination above the cleanup levels outside the regraded pile footprint for placement under the cap
- Install the cap system and establish vegetation
- Install wells for long-term ground water/leachate monitoring
- Install perimeter fence around the entire EDM property with warning signs
- Demobilize equipment
- Implement land use restrictions to prevent disturbance of the cap or its associated structures
- Continue operation of the treatment plant (under the OU1 ROD), long term monitoring, site inspections, cap maintenance and any other tasks needed to maintain the protectiveness of the remedy

Augmented In-Place Closure

Total Capital Cost	$ 10,160,000
Average Annual O&M	$ 261,500
Total Present Worth	$ 14,180,000
Time to Implement	12 months

Discussions of the In-Place Closure alternative with local business and community leaders have resulted in the identification of potential redevelopment scenarios for the Site. An augmentation to the In-Place Closure alternative above could provide available land for redevelopment on the eastern portion of the Site. The augmentation incorporates construction of a soil (or other) effective retaining structure on the southern and western portions of the Site to allow additional consolidation of fluff material to the west. Fill material would be brought to the Site to help level a portion of the site at the east end for potential building construction in that area.

This grading change provides for four to six acres maximum of available land for redevelopment. This parcel would have access to Liberty Avenue and is adjacent to Conrail tracks providing good opportunities for transportation of products and raw materials. The remedy implementation time and cost are estimated to be within 10% of the costs associated with the in-place closure alternative above and would have a Net Present Value cost of $14,180,000.

X. COMPARATIVE ANALYSIS OF ALTERNATIVES

EPA has selected Alternative 6, Augmented in-place Closure. EPA believes that Alternative 6 provides the best balance of trade-offs among the alternatives with respect to the nine (9) evaluation criteria set forth in the NCP at 40 C.F.R. Section 300.430(e)(9) to evaluate alternatives, based on current information. This section profiles the performance of the selected remedy against the nine criteria, noting how the Selected remedy compares to the other options under consideration. Table II, Appendix I shows a comparison table from the FFS which rates the alternatives based on the first seven criteria. The last two criteria - state acceptance and community acceptance are rated after the comment period and public meeting and are discussed below.

Alternative 1- Recycling, Alternative 4 - Arc Melter Technology, and Alternative 5 - Landfill Cover have been eliminated from detailed evaluation. Alternative 1, the recycling remedy was not viable because it would not comply with the required regulations and there was no market for the material. Alternative 4, Arc Melter Technology was unproven for this application and was potentially dangerous. Alternative 5, Landfill Cover was not practical because the material did not meet state requirements and there was no commercial interest in its use.

Overall Protection of Human Health and the Environment - 40 C.F.R. Section 300.43(e)(9)(iii)(A)

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.

All of the retained remedial alternatives meet the established remedial action objectives, including the threshold criteria of adequate protection of human health and the environment. Alternatives 2, 3a, and 3b protect human health and the environment by removing the hazardous component of the fluff from the Site, while Alternative 6 provides protection through in-place containment. Alternative 6 will provide adequate protection from exposure due to direct contact and/or ingestion, however, perpetual cap maintenance will be required to ensure total protectiveness. Any substantial breach in the cap would potentially expose individuals to existing levels of contamination and would allow the generation of leachate.

Compliance with ARARs - Section 121(d) of CERCLA and NCP Section 300.430(f)(1)(ii)(B) require remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as “ARARs,” unless such ARARs are waived under Section 121(d)(4) of CERCLA and Sections 300.430(f)(ii)(C) of the NCP.

<u>Applicable Requirements</u> are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a Superfund site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria or limitations promulgated under Federal environmental

or State environmental or facility siting laws that while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at a CERCLA site that their use is well suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

Each retained alternative is expected to comply with the identified ARARs. The federal RCRA program which manages hazardous wastes was delegated to the Commonwealth of Pennsylvania. Since the material was disposed before the RCRA hazardous waste regulations were passed by Congress, the hazardous waste regulations do not apply unless the fluff is removed from the area of contamination, or is removed and treated. EPA has the authority to selectively apply some of the RCRA regulations when these regulations are both relevant and appropriate for the Site conditions. Since Alternative 6, capping, would leave the waste in place, the RCRA regulations would not be applicable, although certain aspects of the RCRA regulations are relevant and appropriate. EPA prefers a RCRA equivalent cap for the fluff pile to make sure that the waste is contained adequately. Alternatives which remove the waste from the site or treat the waste ex-situ would trigger application of the RCRA regulations, including the Land Disposal Restriction regulations. Consequently, EPA would need to obtain a waiver of the Phase 4 Land Disposal Restriction requirement for the reduction of PCB content in the fluff for all alternatives except Alternative 6. Until an interpretation is provided by the TSCA program, it is assumed that secondary recycling facilities are afforded exemptions similar to those granted for recycling processes. This does introduce some uncertainty into the process, and only Alternative 6 could definitely meet all of the ARARs.

Each Alternative includes appropriate measures to ensure that all action-specific ARARs are satisfied or waived. Thus, each retained alternative is expected to ultimately comply with the ARARs identified, but Alternative 6 would meet all ARARs requirements without using waivers.

Long-term Effectiveness and Permanence - Long term effectiveness and permanence refer to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up goals have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Alternatives 2, 3a and 3b have a similar degree of long term effectiveness and permanence based on removal of the component of the fluff - PVC - containing most of the contaminants from the Site. However, it should be noted that these materials will require long-term containment at the receiving facility. Alternative 6 will also provide a suitable level of long-term effectiveness, given the planned long-term inspections, maintenance and monitoring of the remedy and its components. The solidification process would, however, marginally improve the long-term effectiveness of Alternatives 2, 3a, and 3b by immobilizing lead. All of the alternatives presented will provide a similar level of long-term effectiveness and permanence.

Reduction of Toxicity, Mobility or Volume Through Treatment - Reduction of toxicity, mobility or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

On-site stabilization of the fluff is incorporated in Alternatives 2, 3a and 3b. Stabilization satisfies the CERCLA preference for remedial alternatives that permanently and significantly reduces the mobility, toxicity or volume of the hazardous substances through waste treatment. The stabilization process reduces the contaminant mobility (reduces leachability to a minor degree, given that PCBs and lead are already not very leachable). The toxicity of the fluff has been better defined through sampling and analysis during the FFS evaluation. The leachability of lead in fluff, under natural conditions, has been found to be much lower than anticipated (0.008 mg/kg) using the SPLP analysis described in Appendix E of ("Act II"). As expected, leachable PCB concentrations were non-detect (TCLP) in the fluff. None of the Alternatives reduces the volume of contaminated material in the fluff pile, and the stabilization alternatives (Alternatives 2, 3a and 3b) may actually increase the overall waste volume through the addition of stabilizing agents. The separation alternatives generally, concentrate the contaminants in the remaining materials. Only the copper recovery alternative minimally reduces the physical volume of the material for disposal (1.5 percent of the total fluff pile mass).

Short Term Effectiveness - Short term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternatives 2, 3a and 3b present significantly greater short- term exposure risks than Alternative 6 because of the greater degree of material disturbance, handling and dust control required. The loading and off-site transportation of the large volume of waste materials associated with alternatives 2, 3a and 3b also present significant short-term implementation risks. Alternative 6 presents the highest degree of short-term effectiveness, based on its shorter implementation schedule and the lesser degree of material disturbance and handling. Alternative 3a presents the lowest degree of short-term effectiveness, based on a greater degree of material handling and a longer implementation schedule which is about five times longer than the other alternatives.

Implementability - Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as the availability of services and materials, administrative feasibility, and coordination with other government entities are also considered.

Each of the retained alternatives involve proven technologies which can be adapted and constructed to operate effectively at the Site. The selected copper separation process in Alternative 3b doesn't significantly increase the implementation schedule when compared to stabilization alone, but does substantially increase the potential for equipment down-time and project delays, because the entire fluff pile will need to be processed. Because Alternative 3b requires drying of the material to less than 5 percent moisture for effective separation, significant power consumption will be required. The separation of PE in Alternative 3a requires a significant volume of water for implementation. Alternative 2 is a relatively straightforward remediation process, and will likely require the least involved design effort prior to implementation. Alternative 6 will require the regrading of material to establish suitable side slopes prior to installing the low-permeability cap, but preliminary design evaluations have determined that this is readily implementable. Additional treatability studies would need to be conducted prior to and during the design of Alternatives 3a and 3b. The significant volumes of material to be stabilized and transported off-site for disposal in association with Alternatives 2, 3a and 3b, present some significant implementation concerns and potential risks associated with increased truck traffic, potential traffic accidents and spills. Overall, Alternative 6 is considered to be the best alternative with respect to its implementability.

Cost - The estimated cost of the remedy including capital cost, operations and maintenance costs, and overall present worth cost of the alternatives.

A summary of the total estimated present worth cost for each alternative is as follows:

Alt. 2 - On-Site Stabilization and Off-Site Disposal	$ 24,680,000
Alt. 3a - On-Site Separation and Resource Recovery of Polyethylene and Off- Site Disposal	$ 34,730,000

Alt. 3b - On-Site Separation and Resource Recovery of Copper and Off-Site Disposal $ 27,968,000

Alt. 6 - In-Place Closure $ 12,891,000

In-Place Closure with Engineering Design That Would Allow Beneficial Re-Use of Some Property $ 14,180,000

The cost presented for Alternative 6 includes long- term operation and maintenance ("O&M") costs, including operation of the Site Treatment Plant, which have been estimated based on an assumed 30 year O&M period and a five percent discount rate. O&M costs for Alternatives 2, 3a, and 3b includes operation of the Site Treatment Plant for five years post remedy implementation. All of the alternatives address the remediation of soils underlying the fluff pile, closure of the runoff basin, and perimeter/soil fluff.

The total Present Worth project cost for Alternatives 2, 3a and 3b is based upon the assumption that disposal of the stabilized fluff will be in a Subtitle D (solid waste) landfill. If a permit modification is not obtained by the receiving landfill, and if disposal in a TSCA landfill is required, the transportation and disposal cost of the remedy will increase to $120 to $200 per ton, more than double the $50 per ton cost presented in this evaluation.

State Acceptance - Acceptance of the remedial alternative by the Commonwealth of Pennsylvania's Department of Environmental Protection.

The PADEP has concurred with the selected remedy.

Community Acceptance - The acceptance by the community is judged by comments received during the comment period and during the Proposed Plan public meeting.

EPA has received numerous comments from both residents and elected officials both in writing and during the public meeting opposing the capping alternative (Alternative 6).

The public meeting was attended by approximately 200 people. Opposition at the public meeting was vigorous and unanimously against capping the fluff pile. Congressman Tim Holden and his aide Bill Hanley attended the meeting. Congressman Holden read a prepared statement to the public meeting record in opposition to the cap alternative. State Representative Argall also sent Mr. Mike Ogurski, who also read a prepared statement opposing the cap alternative.

Congressman Holden submitted a letter to Brad Campbell, the (now former) Regional Administrator, in opposition to the cap and also submitted a letter to Carol Browner, EPA's Administrator, asking for a meeting to discuss the proposed cap alternative. Carol Browner was unable to meet with him, and Congressman Holden met with Tim Fields and Brad Campbell at EPA Headquarters to discuss the cap alternative. Congressman Holden asked EPA to verify the relative costs of treatment and offsite disposal versus capping. Subsequently, Congressman Holden asked again for a meeting with Carol Browner, but a change in administration prevented this meeting. EPA suggested a followup meeting after the cost review was completed. State Senator James Rhoades also submitted a letter to EPA during the comment period opposing the cap alternative.

Approximately 1400 signatures were submitted on a petition opposing the capping alternative which stated: "We the undersigned request that the EPA removes the entire Diversified Metals fluff pile. We also want the entire site remediated and cleaned up as soon as possible. We do not want the fluff pile capped." Additionally, eighteen letters from individuals were received in opposition to the capping alternative during the comment period. A more detailed discussion of the specific issues raised in the public's comments will be included in the attached Responsiveness Summary.

Rush Township, Kline Township and Tamaqua Borough all submitted letters opposing the cap alternative, as did Schuylkill County. The following environmental organizations also expressed opposition to the cap alternative: 1) Little Schuylkill Conservation Club; 2) Schuylkill Headwaters Association; Rush Township Environmental Commission; and 4) Schuylkill Conservation District.

Lucent Technologies sent a letter during the comment period supporting the cap alternative.

XI. PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). Identifying principal threat waste combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The manner in which principal threats are addressed will generally determine whether the statutory preference for treatment as a principal element is satisfied.

Although no “threshhold level” of toxicity has been established to identify principal threat wastes, a general rule of thumb has been to consider wastes posing a potential risk several orders of magnitude above risk based levels.

The most toxic substances at the EDM site were dioxin, PCBs and lead. A principal threat analysis of these compounds follows:

Dioxins in soils - EPA’s current policy is to clean up dioxins to 1 ppb in residential areas and 5ppb to 20 ppb in industrial areas. However, EPA is close to issuing a dioxin reassessment report which may cause EPA to reevaluate those levels. Dioxin concentration levels two orders of magnitude (100 ppb) would then constitute relatively conservative level for a principal threat in an industrial site setting. EPA believes that the fluff and soil above this level have already been removed by the remedial action required under the first ROD. Dioxins are large molecules with relatively low mobility which tend to adhere to soil surfaces.

Lead - EPA’s guidance suggests treatment of Principal Threats and containment of lower level threats. A “rule of thumb” is that concentrations two orders of magnitude (100x) above safe concentrations of contaminants are principal threats. A concentration of 400 ppm lead is considered to be a safe level of lead in a residential play area. Two orders of magnitude above this level would be 40,000 ppm. This 40,000 ppm level could be used as the line above which treatment, as opposed to onsite or offsite containment, of the lead should occur. This 40,000 ppm lead level was, in fact, used at another Superfund Site in Region 3 that is similar in many ways to the EDM Site. Sampling has shown that the soil and fluff at the EDM Site are well below this threshold level for treatment of lead which poses a Principal Threat. At the EDM Site, lead has been relatively immobile and is only present at low levels in leachate despite the large volume of material. This cleanup level of 400 ppm will be fully protective of human health and the environment long into the future.

PCBs - A level of 1 ppm is considered to be safe for residential areas by EPA’s guidance documents. Two orders of magnitude above this level would be 100 ppm. EPA’s sampling results indicate that virtually all of the fluff and site soils are below this level. PCBs are also relatively large molecules with low solubility and mobility which tend to adsorb to soils.

In summary, EPA believes that the only principal threat at the Site was the fluff contaminated with high levels of dioxins due to the fires at the Site. This material has been removed and sent offsite for incineration. The relatively low mobility of the most toxic contaminants makes containment a very viable alternative which will be protective of human health and the environment.

XII. SELECTED REMEDY AND PERFORMANCE STANDARDS

Rationale for the Selected Remedy

<u>Alternative 6 - In Place Closure With Institutional Controls and an Engineering Design That Would Allow Beneficial Re-Use of Some Property</u> - the Selected Remedy. This alternative is recommended because it will achieve substantial risk reduction by preventing any contact with the waste and contaminated soils, and will eventually eliminate leachate and further sediment contamination of the stream to the south of the Site. This alternative will provide as much acreage as possible to encourage beneficial reuse for a commercial or industrial enterprise. This Alternative will reduce risk sooner and will cost much less than the other Alternatives. This alternative will minimize the number of trucks or railcars carrying hazardous waste and traveling through the community. It will reduce the amount of dust generated by minimizing the amount of fluff disturbance and materials handling. Since the contaminants are non- volatile, dust would be a major exposure pathway and this alternative will minimize the risk from dust.

Institutional controls will prevent erosion or damage to the cap and associated structures such as the storm water conveyances, leachate collection and treatment system and subsequent contact with the waste. The institutional controls on the use of the cap are necessary to prevent erosion and damage to the liners by heavy equipment. The fluff material is compressible and although the design will produce a stable cap, this material and its cap are not a good candidate for any active use, including recreational uses. Recreational use of the cap is inappropriate because the cap is terraced and would not provide a large flat area in that the cap will be designed to facilitate runoff. Recreational use would increase erosion and maintenance costs and pose a potential liability risk to the PRP and the government. The capped area, drainage channels, leachate collection and treatment system, maintenance roads and monitoring wells will require virtually all of the land within the restricted area, and institutional controls will protect their integrity. EPA is concentrating the usable area at the eastern end of the site for potential appropriate industrial and commercial reuse.

A fence is necessary to prevent trespassing by children who could potentially drown in the stormwater impoundment or be injured by other physical hazards presented by the Site. The fence will also reduce the potential for vandalism of the wellheads, treatment system, or inappropriate use by motorized recreational vehicles.

This Alternative is the only viable alternative which would not require an ARARs waiver of the Phase IV Land Disposal Restriction for the treatment of underlying hazardous constituents (primarily PCBs). The Phase IV LDRs would require that PCBs be reduced to 10 ppm or below if the waste were treated to remove the lead characteristic. Incineration is probably the only practical way to achieve this level and would be cost prohibitive. Even if a waiver of this requirement were obtained, state restrictions on landfill acceptance of waste containing PCBs is another difficult hurdle that could prevent disposal, or dramatically increase costs. Solid waste landfills in Pennsylvania at a reasonable distance (Figure 1b) would need a major permit modification and would require a public hearing to accept the wastes from EDM. At least one of those landfills has been subjected to antagonism from the public and a notice that CERCLA wastes would be disposed would only provoke the situation. Additionally, EPA did not consider moving the material from one community containment to another community containment to be appropriate.

Alternative 6 will also revise the following actions for the PCB fluff “hotspots” as defined in ROD# 1.

1) PCB Hot Spots The ROD#1 issued in 1990 called for incineration of "PCB hotspots" of fluff which were over 25 ppm of PCBs. At the time, several detections of very high levels of PCBs were reported in a very small area of the fluff pile. Further sampling and examination by Lucent indicated that these very high levels were not due to PCBs, but were due to a similar compound known as polychlorinated naphthalenes which were misidentified as PCBs. The very stringent human health cleanup level of 25 ppm PCBs in fluff to be incinerated was selected because a relatively small volume of contaminated fluff above that level was expected based on the analytical results available at that time. If equipment were already mobilized to remove the high levels of PCBs, it would not have been excessively expensive to remediate the small areas down to below 25 ppm of PCBs. Further studies of the fluff, however, have shown that the average PCB level in the fluff is about 50-60 ppm and virtually all of the fluff contains PCBs at concentrations below 100 ppm. If the original ROD was implemented, it would require incineration of the entire fluff pile at enormous cost. Additionally, incineration could pose a risk to the community living near the incinerator due to the propensity for dioxin production from the incineration of PVC. The selected remedy will adequately address the fluff contaminated with this level of PCBs by placing this PCB contaminated fluff under the cap.

2) PCB Cleanup Levels ROD#1 issued in 1990 required that fate and transport modeling be conducted for the cleanup level to be used to remediate the hotspots. The ROD stated that either a cleanup level of 25 ppm of PCBs be used, or the level based on Fate and Transport modeling whichever is lower. Because the identified PCB hotspots were due to an analytical problem and did not really exist, no fate and transport modeling was conducted and the PCB removal action was never conducted. The selected remedy will adequately address the actual PCB levels in the fluff by preventing contact or inhalation.

In summary, there are no principal threats remaining at the site, and consequently containment of the remaining fluff and contaminated soils is the most appropriate remedial action. Additionally, this remedy is consistent with remedies selected at similar sites in Region 3 and across the nation.

Description of the Selected Remedy and Performance Standards

General Description

Alternative 6 consists of an on-site containment system for the fluff, debris and soils contaminated above cleanup levels. This alternative constitutes hybrid-landfill closure. Disposal occurred before RCRA and therefore only landfill requirements which are relevant and appropriate are required. This system shall include a low-permeability, RCRA equivalent, composite barrier cap; an upgradient surface and ground water diversion/barrier. The downgradient leachate and overburden ground water collection will be relocated and treatment will continue under the OU1 ROD. The remedy also includes a fence around the perimeter of the property, and warning signs. A stormwater collection basin and drainage channels shall be constructed to prevent run-on and to collect run-off as described in the Focused Feasibility Study. Institutional controls will be utilized to prevent damage to the cap and associated structures, damage to the leachate collection system or stormwater control system. The institutional controls will also prevent access to the site by unauthorized personnel because of physical hazards. Ground water monitoring will be conducted to detect any potential (but unlikely) releases from the containment system. Ongoing maintenance will be conducted as necessary and periodic inspections of the cap will be required. Five year statutory reviews will be required because waste will be left in place.

Performance Standards

1) Onsite soils outside the footprint of the cap area described in number 3 below, must meet the following cleanup levels for Site contaminants which are shown in the following table which also gives the risk associated with each contaminant soil concentration. The soil cleanup levels are given in the following table:

Constituent	**Soil Cleanup Level**	**Risk at Cleanup Level**	**Hazard Index at Cleanup Level**
Manganese	1,000 mg/kg		0.006
Copper	270 mg/kg		0.007
Zinc	400 mg/kg		0.002
DEHP bis (2-ethyhexyl) phthalate	100 mg/kg	0.2E-05	0.10
PCBs	10 mg/kg	1.4E-05	
Dioxins	0.50 ug/kg	3.5E-05	
Total Risk or HI		**5.1E-05**	**0.12**

The lead soil cleanup level will be 400 ppm. Lead contact risks are calculated differently than the other metals which focus on the damage to organs. The acceptable lead level is based on the risk to the intelligence of infants and developing children. The resulting safe lead levels are much lower than if they were developed based on damage to organs. The mathematical basis is different and lead is not added to the aggregate Hazard Index.

All contaminated fluff above the cleanup levels for fluff set in the first Record of Decision have been removed and incinerated, but soils beneath this dioxin removal (Former Burn Area) area are generally above the soil cleanup levels stated above for exposed soils. The disposition of the various levels of dioxin contaminated soils will be as follows:

Soils above the exposed soil cleanup level of 0.50 ppb, but below 50 ppb TEQ will be shall be consolidated with the fluff in accordance with (2) below.

Soils with dioxins above 100 ppb Toxicity Equivalent (TEQ) shall be sent for offsite incineration to a facility in conformance with Section 121(d)(3) of CERCLA. Soils with dioxins between 50 and 100 ppb TEQ shall be sent to either an offsite incinerator, or to a RCRA Subtitle C hazardous waste landfill in conformance with Section 121(d)(3) of CERCLA. Soils above the exposed soil cleanup level of 0.5 ppb, but below 50 ppb TEQ will be placed under the onsite cap.

2) In order to contain the fluff and contaminated soil within an engineered cap, redistribute and grade the fluff on the Site in order to establish stable slopes for the cap components. About forty two percent of the fluff will need to be moved and regraded. To minimize slope stability concerns, final side slopes of no more than 4 horizontal to 1 vertical (4H:1V) shall be constructed, with a 15 foot wide terrace for every 25 feet of vertical rise (see Figure 8). Regrading of the fluff will increase the fluff pile footprint. However, this increase can be managed within the area of contamination and the Site Boundary (See Figure 7).

3) Install a cap over all of the regraded fluff pile and the soil placed in accordance with (1) above to prevent contact with any of this waste and contaminated soil and to prevent significant leaching of water into the waste and contaminated soil. The cap design will be for a “RCRA equivalent” multilayered cap (See Figure 6) in compliance with 40 C.F.R. Section 264.301(c)(1)(i)(A) for the cap liner. The cap will also comply with 40 C.F.R. Section 264.310(a), 40 C.F.R. 264.310(b)(1), and 40 C.F.R. 264.310(b)(5). The cap will be installed with the following components(“the Cap”): 1) A soil subbase of about 12 inches (exact amount determined during remedial design) will be placed over the graded fluff; 2) A geocomposite liner (GCL) with a permeability of less than 10-7 will be installed over the subbase. A 40 mil textured high density polyethylene liner (HDPE) liner

will be installed over the GCL. A drainage net will be installed over the HDPE liner and will be covered by 18" of clean soil which meets PADEP standards for safe fill. Six inches of topsoil which also meets PADEP standards for safe fill will form the top layer of the containment. The cap will be seeded and mulched and appropriate erosion controls will be maintained as required by 25 PA Code Section 288.236, until a vegetative cover has been established successfully as defined by 25 PA Code Section 288.237.

4) During the remedial design, conduct a study to estimate of the amount of landfill gas emitted and the constituents in the landfill gas to determine whether a gas collection system and treatment system is needed. Landfill gas shall be managed as required by Pa. Code 25 section 273.171 and relevant sections of 25 Pa. Code Chapter 288, including construction of a gas collection system in accordance with these provisions. If a gas collection system is constructed, the landfill gas emitted will be sampled to determine whether gas controls are needed to prevent an explosion risk or 10-6 risk to human health, or the environment. If controls are needed, they will be installed to reduce those risks to the public and in accordance with any applicable requirements of the Clean Air Act.

5) The potential for surface water and ground water infiltration through the fluff, shall be reduced to the maximum extent practicable through the installation of storm water, surface water and leachate controls (i.e., storm water diversions/swales/basins, an upgradient trench for diversion of overburden ground water, and relocation of the downgradient collection trench to contain impacted overburden water and leachate for treatment).

An upgradient ground water diversion trench shall be constructed deep enough to intercept overburden ground water which otherwise might infiltrate through the fluff, and this water shall be routed around the fluff pile and directed to the unnamed stream tributary to the southwest of the Site.

6) Maintain the current leachate collection system on the downgradient side of the pile to collect water that has infiltrated through the pile material as required by the first ROD. The collected leachate shall be conveyed to the STP prior to discharge through the NPDES outfall to the unnamed tributary (Figure 9). Relocate existing trenches to maintain an efficient combined collection trench located downgradient of the regraded material and outside the footprint of the cap to comply with the first ROD.

7) All water collected in the new downgradient collection trench shall be conveyed to the existing STP, which would treat the collected leachate prior to discharge to comply with the first ROD. PADEP has recently sampled leachate, shallow ground water, influent to the treatment plant and effluent from the treatment plant. The permit for the NPDES discharge has expired and the PADEP will review and may revise discharge levels for the treatment plant.

8) Surface water runoff management and erosion/sediment control measures will be constructed and maintained to ensure compliance with applicable and relevant and appropriate regulations, in accordance with relevant sections of 25 Pa. Code Chapter 102 (erosion control); 25 Pa. Code Chapter 105 (for sediment pond construction and maintenance), and 25 Pa. Code Chapter 288 (the Pennsylvania Residual Waste Management Regulations). Long-term monitoring and site inspections will be conducted at pre-determined locations and intervals to evaluate changes in Site conditions. Management of the surface water to control erosion and sedimentation will be based on a 25-year, 24-hr rainfall. The local County Conservation District will be sent a copy of any erosion and sedimentation control plans.

9) Monitoring wells shall be installed and periodically sampled to make sure that Site contaminants in ground water are not increasing and are not migrating at levels posing a risk to human health and the environment. The ground water shall be sampled for the Target Compound List volatiles and semi-volatiles, the Target Analyte List, and PCBs. The exact number, placement and sampling frequency will be determined by EPA in consultation with PADEP during the remedial design. There will be at least one upgradient well nest of one

well installed in both the shallow and deep zones of the aquifer, and three downgradient well nests with one well installed in both the shallow and deep zones of the aquifer. Because hybrid closure is being used, the ground water monitoring well requirements will not have to comply with all sections of RCRA hazardous waste regulations (Subpart F) which are highly prescriptive and targeted to monitor an active hazardous waste landfill receiving a wide array of wastes. Technical Ground water monitoring requirements will be determined during the remedial design in consultation with the PADEP.

10) Land use restrictions to the cap will be implemented to prevent any land use of the cap, that would pose a risk of damage to the cap and associated structures, or a risk of injury to people from the on-site response structures and equipment. Additionally, this restriction will prevent any disturbance or modifications to any of the ancillary systems which support the viability of the cap such as the surface water drainage systems and the leachate collection systems.

11) Entry along the entire perimeter of the site will be restricted by an eight foot high chainlink fence. Where possible, the existing chainlink fence can be used in order to prevent human activity on the cap and remediation area that could cause damage. Warning signs will be placed at 100 foot intervals so that they can be seen by anyone approaching the fence. Site security will be maintained.

12) Maintenance of the cap will be in accordance with 40 C.F.R. 264.117 and also the approved remedial design requirements.

13) Land use in the portion of the site to be made available for redevelopment will be limited to industrial or commercial use, so long as such use does not include child care or youth recreational facilities. It is anticipated that this restriction will be accomplished through local zoning. Other institutional controls may be employed to accomplish this result if needed.

Implementation Components

Specific components of this alternative, presented in a likely sequence of implementation, include the following:

- Obtain required permits, prepare for equipment/ operations and mobilize to Site
- Install perimeter fence around the entire EDM property with warning signs
- Begin implementing land use restrictions to prevent disturbance of the cap or its associated structures so that these will be in place at completion of construction
- Upgrade surface water runoff management and erosion and sediment control measures and construct upgradient diversion trench
- Relocate the downgradient collection channel by constructing a deeper and perhaps longer trench with a low permeability liner
- Test soils outside the footprint of the cap to see if above cleanup levels early in the remedial action so that results are available before regrading is completed
- Regrade fluff pile and notify EPA of the discovery of any drums, containers, or clearly unusual materials found during regrading, so that EPA can make a decision in consultation with the PADEP on the need to segregate or dispose of these materials
- Consolidate with the graded pile, any visual fluff, mixed wire and soil mounds outside the fence, and soils with contamination above the cleanup levels outside the regraded pile footprint for placement under the cap
- Install the cap system, erosion controls on cap and establish vegetation

- Install wells for long- term ground water/ leachate monitoring

- Demobilize equipment

- Continue operation of the treatment plant as required by the first Record of Decision, and long term monitoring, site inspections, cap maintenance and any other tasks needed to maintain the protectiveness of the remedy as required by this Record of Decision

Additional details of the selected remedy are described in Appendix IV and in Section XIII under Compliance with Applicable or Relevant and Appropriate Requirements.

Discussions of the In-Place Closure alternative with local business and community leaders have resulted in the identification of potential redevelopment scenarios for the Site. Augmentation of the In-Place Closure alternative shall provide available land for redevelopment on the eastern portion of the Site. The augmentation incorporates construction of a soil (or other effective retaining structure such as gabions) retaining wall on the southern and western portions of the Site to allow additional consolidation of fluff material to the west. Fill material meeting PADEP requirements for clean fill will be brought to the Site to help level a portion of the site at the east end for potential building construction in that area.

This grading change will produce at most, four to six acres maximum of available land for redevelopment. This parcel would have access to Liberty Avenue and is adjacent to Conrail tracks providing good opportunities for transportation of products and raw material.

Summary of the Estimated Remedy Costs

Total Capital Cost	$ 10,160,000
Average Annual O&M	$ 261,500
Total Present Worth	$ 14,180,000
Time to Implement	12 months

The remedy implementation time and cost is estimated to be within 10% of the costs associated with the In-Place closure alternative without providing an area for development and would have a NPV cost of $ 14,180,000. The detailed costs are shown in Table 1, Appendix I.

The information in this cost summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost element are likely to occur as a result of new information and data collected during the engineering design of the remedial action. Major changes may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a ROD amendment. The cost estimate is an order of magnitude engineering cost estimate that is expected to be within +30% to -50% of the actual project cost.

Expected Outcomes of the Selected Remedy

The primary expected outcome is the reduction of potential risk to the community from direct exposure to the fluff. The selected remedy will eliminate dust, and migration via surface water runoff, improving the ecological environment in the unnamed tributary and eliminating migration of fluff to the Little Schuylkill River. The landfill will manage landfill gas and treat the gas if necessary eliminating a slight odor that has been perceptible by some residents near the Site. The existing leachate should decrease after the cap is installed and the need to treat the leachate should eventually end.

A No Action ROD has previously been issued for the deep ground water, and as the leachate is reduced due to the cap and associated drainage systems, the already minor risk to the unaffected deep ground water will also be reduced. The reinstallation of the leachate collection system, due to the installation of the cap will give a new opportunity to intercept leachate which currently may be bypassing the existing collection trenches. The leachate collection system is not an element of this ROD, since it was required by a previous ROD. However, the movement of the fluff within the contaminated area and engineering considerations make reinstallation a necessity.

The Site property will be divided into two portions: 1) Approximately four to six acres at the eastern end of the site to be leveled and made available for commercial/ industrial development. 2) All of the remaining area of the property. See conceptual design in Figure 10.

AREA AVAILABLE FOR REUSE

Augmentation of the In-Place Closure alternative will restore land for reuse of the eastern portion of the Site. Fill material meeting PADEP requirements for clean fill, will be brought to the Site to help level a portion of the site at the east end for potential building construction in that area. This grading change will restore about four to six acres maximum of available land for redevelopment. This parcel would have access to Liberty Avenue and is adjacent to Conrail tracks providing good opportunities for transportation of products and raw materials, which should encourage business development and jobs for the community. This ROD is clear that the goal is only to provide the opportunity for future commercial land use and will not include actual commercial or industrial development or the construction of a building or other facilities.

The land provided for development could be used several years after all equipment is demobilized and a durable, mature, vegetated cover has been established on the landfill and the area available for development.

CAPPED AREA AND SUPPORTING STRUCTURES/UTILITIES

With the exception of the eastern portion of the Site available for reuse as discussed above, the remainder of the Site property will be fenced and the only contemplated use will be operation and maintenance of the remedial actions, in accordance with the institutional controls set forth above. Most of this area will be taken up by the cap, drainage structures, stormwater impoundment, maintenance roads and the treatment plant. The primary site contaminant is lead and this contaminant will remain immobile under the cap, therefore, the cap must be maintained indefinitely. The supporting structures and maintenance roads will be needed indefinitely and any development thereof could pose a risk to the integrity of the remedial action. Although there are discrete non-contiguous sections of this area that exist between constructed elements of the remedial action, using these for any purpose other than maintenance of the remedy would pose a risk to the remedial action. Moreover, these small areas within the remedial action construction area will be very small, and so is any corresponding commercial value. The land is within an industrial park and is not suitable for public use and could pose a risk to children or trespassers. Because the cap will be on downward sloping terrain, the cap will need to be terraced and would not make a good candidate for any recreational use. A stormwater impoundment will pose a water hazard to trespassing children and trespassing might lead to vandalism of important structures. The fence will be an impediment to trespassing. After the remedial action is completed, EPA would consider proposals to use the property that would not pose any risk to the integrity of the cap, treatment plant, leachate collection system or associate elements of the remedial action.

The soils must meet the following cleanup levels for Site contaminants which are shown in the following table which also gives the risk associated with each contaminant soil concentration. The soil cleanup levels are given in the following table:

Constituent	Soil Cleanup Level	Risk at Cleanup Level	Hazard Index at Cleanup Level
Manganese	1,000 mg/kg		0.006
Copper	270 mg/kg		0.007
Zinc	400 mg/kg		0.002
DEHP bis (2-ethyhexyl) phthalate	100 mg/kg	0.2E-05	0.10
PCBs	10 mg/kg	1.4E-05	
Dioxins	0.50 ug/kg	3.5E-05	
Total Risk or HI		**5.1E-05**	**0.12**

The lead soil cleanup level will be 400 ppm. Lead contact risks are calculated differently than the other metals which focus on the damage to organs. The acceptable lead level is based on the risk to the intelligence of infants and developing children. The resulting safe lead levels are much lower than if they were developed based on damage to organs. The mathematical basis is different and lead is not added to the aggregate Hazard Index.

Soil areas outside the cap and associated structures, but within the Site fence must also meet the cleanup levels in the above table.

XIII. STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select cost effective remedies that are protective of human health and the environment, comply with applicable of relevant and appropriate requirements (unless a statutory waiver is justified), and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity or mobility of hazardous wastes as a principal element. Thus CERCLA creates a bias against off- site disposal of untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

Protection of Human Health and the Environment

The Selected Remedy, Alternative 6- In-Place Closure, will protect human health and the environment through containment of the fluff and contaminated Site soils. The Selected Remedy will also prevent migration of fluff particles through air and surface water pathways. The leachate will be reduced through time and the discharge to the unnamed tributary should eventually be eliminated. The reduced migration of contaminants should improve the quality of the unnamed tributary and its ecosystem.

The selected remedy will reduce the Site risk to 5.1x 10-5 even if all compounds are present at the Site cleanup levels. This level is towards the upper level of EPA’s target risk range. This is primarily due to the presence of dioxin at the Site and the need to set a cleanup level for dioxin which can be reliably measured, while considering EPA’s guidance documents for dioxin. The summed risk from each component will produce a risk of less than 5.1 x 10-5 risk for a hypothetical soil sample. Dioxin contamination was actually limited to a hotspot which has been removed. EPA, therefore, expects that dioxin will be only be present at much lower levels than 0.5 ppb across most of the Site and consequently, the actual average risk from Site soils will probably be towards the middle of EPA’s risk range after the remediation is completed. The selected remedy reduces the Hazard Index well below 1.0 (generally safe level) for systemic contaminants.

Compliance with Applicable or Relevant and Appropriate Requirements

The Selected Remedy of capping of fluff and contaminated soil complies with all ARARs. The Chemical, Location, and Action-Specific ARARs include the following:

The Commonwealth of Pennsylvania, Department of Environmental Protection, has identified Pennsylvania’s Land Recycling and Environmental Remediation Standards Act (Act 2 of 1995) as an ARAR. EPA has determined that Act 2 does not, on the facts and circumstances at the Site, impose any requirements that are more stringent than the Federal standards.

Chemical Specific ARARs

None

Location Specific ARARs

None

Applicable Action-Specific ARARs

In the event that unexpected hazardous wastes such as unusual sludges, liquids or other materials not part of the normal fluff materials are discovered during the remedial action, the Pennsylvania Hazardous Waste Management Regulations, 25 Pa. Code Chapters 261a, and 262a, and 40 C.F.R. Part 264, 40 C.F.R. Section 261.24(toxicity characteristic), would be applicable for the identification, generation, and handling of these hazardous wastes. Applicable sections of 40 C.F.R. include: 262.11 (hazardous waste determination); 262.20 and 262.23 (general requirements and manifests); and 262.30 and 262.33(pre-transport requirements).

40 C.F.R. Section 264.114(Subpart G)(disposal or decontamination of equipment, structures and soils) is applicable to the decontamination of equipment used in the excavation of contaminated materials during the construction of the cap.

In the event that unexpected hazardous wastes such as unusual sludges, liquids or other materials not part of the normal fluff materials are excavated and managed prior to shipping the wastes offsite, 40 C. F. R. Subparts 264 Subchapters I, J and L contain provisions that would be relevant and appropriate to the temporary storage of these hazardous wastes on-site in containers, tanks or waste piles during excavation, storage and treatment of any buried drums, sludges or liquid wastes which exhibit a RCRA characteristic other than for lead. These provisions include: 40 C.F.R Sections 264.171-179(use and management of containers); 40 C.F.R. Sections 264.192-194, 197-199 (tanks); and 40 C.F.R. Sections 264.251-258 (waste piles).

Relevant and Appropriate Action Specific ARARs

Multilayer Cap:

The cap will meet 40 C.F.R. Section 264.301(c)(1)(i)(A) which prevents leachate from penetrating the liner. The cap will also comply with 40 C. F. R. Section 264.310(a), 40 C.F.R. 264.310(b)(1), and 40 C.F.R. 264.310(b)(5).

The cap will be seeded and mulched and appropriate erosion controls will be maintained as required by 25 Pa. Code Section 288.236, until a vegetative cover has been established successfully as defined by 25 Pa. Code 288.237.

Property controls will be maintained to make sure that no damage to the cap or associated structures occurs as required by 40 C.F.R. Section 264.117.

Erosion and Sedimentation Controls

Surface water runoff management and erosion/ sediment control measures will be constructed and maintained to ensure compliance with applicable and relevant and appropriate regulations, in accordance with 25 Pa. Code Chapter 102 (erosion and sediment controls), Sections 102.4, 102.11, and 102.22, and 25 Pa. Code Chapter 288, Sections 288.242 and 288.243 of the Pennsylvania Residual Waste Management Regulations.

Sediment pond construction and maintenance will be conducted in accordance with 25 Pa. Code Chapter 105(dam safety and waterway management), Subchapter B, Sections 105.102-107; and 105.131-136.

Air Emissions

During construction of the remedial action required by this ROD, fugitive emissions will be controlled as required by 25 Pa Code Section 123.2 and odors from the Site and the completed capped landfill will be limited as required by 25 Pa Code Section 123.31. Explosive and toxic threats from gas emissions will be controlled as required by 25 Pa. Code 288.262, and 25 Pa. Code Section 273.171.

Closure and Maintenance

Closure and Post Closure requirements will be determined by EPA in consultation with the PADEP in compliance with the relevant requirements of 40 C.F.R. Section 264.310 during the Remedial Design.

Maintenance of the cap will be in accordance with relevant sections of 40 C.F.R. Section 264.117 as detailed in the approved remedial design requirements.

Access will be restricted in compliance with 25 Pa. Code, 288.212 as determined during the remedial design.

Relevant and Appropriate ground water monitoring requirements of 25 Pa. Code, Chapter 264a, section 264a. 97 shall be determined during the remedial design in consultation with the PADEP.

Other Criteria or Guidance To Be Considered (TBCs) for This Remedial Action

In implementing the Selected Remedy, EPA and the State have agreed to consider a number of non-binding criteria that are TBCs, as follows:

EPA’s “Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites,” OSWER Directive 9200.4-26, April 13, 1998, was taken into consideration in developing preliminary soil remediation goals for dioxin.

EPA/540/G-90/007, August 1990, “Guidance on Remedial Actions for Superfund Sites with PCB contamination.”

EPA Office of Solid Waste and Emergency Response’s “Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities” (OSWER Directive# 9200.4-27, August 27, 1998).

This is an existing landfill, not a new landfill and the PADEP’s new landfill siting criteria are in general not relevant and appropriate. However, to the extent practicable, EPA will address the technical issues embodied in the siting criteria during the remedial design.

Cost-Effectiveness

In the lead agency's judgement, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP Section 300.430(f)(1)(ii)(D)). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e. were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility and volume through treatment; and short term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money to be spent.

The estimated present worth cost of the Selected Remedy is $14,180,000. The only other reasonable alternative is Alternative 2 - On-Site Stabilization and Off-Site Disposal at a cost of $24,680,00. This is about seventy four percent higher in cost than In-Place closure which is also above $10 million. If EPA had selected On-Site Stabilization and Off-Site Disposal, EPA would have required Region 3 to submit the selected remedy to the National Remedy Review Board in EPA Headquarters. This Board is charged with encouraging cost effective remedies and national consistency. The Board must review any remedy which is more than 50% greater in cost than another protective remedy if the remedy is more than $10 million. Additionally, the actual cost of Alternative 2 could be much higher if the wastes must be sent to a TSCA or RCRA landfill.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practical manner at the Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Selected Remedy provides the best balance of trade offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and considering state and community acceptance.

Preference for Treatment as a Principal Element

By utilizing treatment as a significant portion of the first ROD (OU1 -incineration of dioxin contaminated fluff), the statutory preference for remedies that employ treatment as a principal element is satisfied for the Site but not for this action.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be protective of human health and the environment.

XIV. DOCUMENTATION OF SIGNIFICANT CHANGES

During the public comment period, extensive public opposition to capping was expressed by residents, township officials, county officials and other elected officials. The public was particularly concerned about the long-term safety of the capping alternative. The Biological Technical Assistance Group (BTAG) also advised lower levels for some of the Site contaminants. Although EPA could not justify treatment and offsite disposal, EPA has reduced the cleanup levels of the most significant and high risk contaminants to levels that would be safe even if the onsite soils outside the cap were used as a location for residential use. These soil cleanup levels will give an added level of protection and hopefully more public confidence that the capping alternative will be safe for both the community and the ecology for the indefinite future.

Based on borings taken in the Fall of 2000, the compounds of concern are limited to the upper foot of soil or at the most, the two feet of soil in some areas. The lower cleanup levels contained in this ROD should have a very minor impact on the cost of the capping alternative.

The need to test for gas generation and controls is a normal landfill construction requirement, but was not explicitly stated in the Proposed Plan.

Appendix I

Table 1

Cost Analysis - Alternative 6A: Augmented In-Place Closure (1-year Design/1-year Remedy Implementation Period)
Eastern Diversified Metals Site
Hometown, PA

Component	Quantity	Units	Unit Cost	Component Cost
Design/Agency Approval				
Remedial Action Work Plan Preparation	1	LS	$100,000	$100,000
Engineering Design	1	LS	$250,000	$250,000
Contractor Bidding/Selection	1	LS	$30,000	$30,000
Property Use Restrictions	1	LS	$30,000	$30,000
Agency Negotiations/Revisions/Approval	1	LS	$50,000	$50,000
				$460,000
Site Preparation/Improvements				
Temporary Erosion and Sediment Controls	1	LS	$100,000	$100,000
Site Preparation (Expanded Footprint Clearing & Grubing)	1	LS	$120,000	$120,000
Additional Fence and Gates	1	LS	$40,000	$40,000
Existing Road Improvements	1	LS	$50,000	$50,000
Treatment Plant Access Road Construction	1500	ft	$60	$90,000
Drainage Improvements	1	LS	$15,000	$15,000
Gravel Lots	1	LS	$10,000	$10,000
Decon Pad	1	LS	$25,000	$25,000
Water Supply	1	LS	$10,000	$10,000
				$460,000
Project Implementation				
North Side Diversion Trench Installation (Barrier & Trench, Avg. Depth of 20')	1200	ft	$650	$780,000
North Side Diversion Installation (Trench, Avg. Depth of 8')	425	ft	$200	$85,000
South Side Collection Trench Upgrade (Barrier & Trench, Avg. Depth of 20')	1,350	ft	$650	$877,500
Excavation of Existing Basin & Perimeter Soil/Fluff & Consolidation with Pile	9,421	cy	$15	$141,300
Pile Regarding (55% of the pile)	137,500	cy	$10	$1,375,000
Reinforced Soil Dike (along southwest portion of the pile)	13,700	cy	$25	$342,500
Dike Slope Liner (80-mil textured HDPE)	31,000	sf	$1.30	$40,300
Bedding Geotextile	31,000	sf	$0.65	$20,200
Drainage Net (double geocomposite)	31,000	sf	$0.75	$23,300
Protective Cover	1,100	cy	$15.00	$16,500
Low Permeability Multi-Layer Cap (installed cost)	9.5	acre	$188,800	-
Bedding Soil (12 inches)	15,327	cy	$12	$183,900
Geocomposite Clay Liner (GCL)	413,820	sf	$1	$413,800
40-mil HDPE Liner (textured)	413,820	sf	$0.90	$372,400
Drainage Net (double geocomposite)	413,820	sf	$0.75	$310,400
Soil Cover (18 inches)	22,990	cy	$12	$275,900
Topsoil (6 inches)	7,663	cy	$25	$191,600
Cap Seeding/Mulching	45,980	sy	$1	$46,000
Cap Runoff Controls (10% of cap cost)	1	LS	$179,400	$179,400
Permanent Stormwater Control Basin	1	ea	$120,000	$120,000
Collection Channel Construction	3,300	ft	$20	$66,000
Monitoring Well Installation	4	ea	$5,000	$20,000
				$5,881,000
Oversight/Quality Assurance				
Resident Engineers (2 full-time for duration of remedy implementation)[1]	1	yr	$500,000	$500,000
Post Excavation Soil Sampling/Analysis (off-cap areas)	30	sample	$1,000	$30,000
				$530,000
Site Restoration				
Soil Fill for Redevelopment Area (5 acres @ 18th ave.)	12,100	cy	$25	$302,500
Off-Cap Topsoil (remaining disturbed area - 5.5 acres @ 6")	4,437	cy	$20	$88,700
Off-Cap Topsoil Grading	8,470	cy	$5	$42,400
Off-Cap Seeding/Mulching	50,820	sy	$1	$50,800
				$484,000
Capital/Implementation Subtotal				$7,815,000
Contingency (30%)				$2,345,000
Total Capital/Implementation Cost				$10,160,000

Operation and Maintenance Components		Duration	Annual Cost	Present Worth [2]
Annual Treatment Plant Operation and Maintenance				
Treatment Plant Electricity		30 years	$9,600	$147,600
Waste Water Treatment Plant Operation/Oversight		30 years	$140,000	$2,152,000
Resin Replacement		30 years	$15,000	$230,600
Closure Maintenance and Monitoring				
Annual Cap Maintenance (year 1-2)			$30,000	$55,800
Annual Cap Maintenance (year 3-30)			$15,000	$202,700
Quarterly Ground Water Monitoring (year 1-2)			$40,000	$74,400
Semi-Annual Ground Water Monitoring (year 1-2)			$20,000	$49,400
Annual Ground Water Monitoring (year 6-30)			$10,000	$110,400
EPA 5-Year Review (year 5, 10,15, 20, 25, 30)			$25,000	$69,600
Present Worth O&M Subtotal				$3,092,600
Contingency (30%)				$927,800
Total Discounted Present Worth O&M Cost				$4,020,400
Average Annual O&M Cost (A/P for 30 years @ 5%)				$261,500
Total Present Worth Alternative Cost				$14,180,000

Notes:

1 Resident Engineer component includes Health and Safety monitoring and office support.

2 A discount rate of 5% after inflation was assumed for the Present Worth analysis.

Table 2 *Comparative Evaluation of Remedial Alternatives*

EVALUATION CRITERIA	POTENTIAL REMEDIAL ALTERNATIVES Alternative 2 Stabilization/Disposal	Alternative 3a Stabilization/Disposal and PE Recovery	Alternative 3b Stabilization/Disposal and Copper Recovery	Alternative 6 In-Place Closure
Overall Protection of Human Health and the Environment	Achieves acceptable risks. (3)	Achieves acceptable risks. (3)	Achieves acceptable risks. (3)	Achieves acceptable risks. (3)
Compliance with ARARs	Expected to satisfy all ARARs. (3)	Expected to satisfy all ARARs. (3)	Expected to satisfy all ARARs. Potential TSCA impact on copper concentrate marketability. (3)	Expected to satisfy all ARARs. (3)
Long-Term Effectiveness and Permanence	Achieves long-term effectiveness, although long-term management required at off-site facility. (3)	Achieves long-term effectiveness, although long-term management required at off-site facility. (3)	Achieves long-term effectiveness, although long-term management required at off-site facility. (3)	Achieves long-term effectiveness, although long-term management required. (3)
Reduction of Toxicity, Mobility or Volume	Stabilization reduces the mobility. (3)	Stabilization reduces the mobility. Process generates a significant volume of wastewater. (2)	Stabilization reduces the mobility. (3)	In-place closure reduces the mobility. (3)
Short-Term Effectiveness	Short-term risks from extensive waste disturbance, handling and off-site transportation. (3)	Short-term risks from extensive waste disturbance, handling and off-site transportation and extended schedule. (2)	Short-term risks from extensive waste disturbance, handling and off-site transportation. (3)	Short implementation schedule and minimal handling of materials, and minimal short-term risks. (4)
Implementability	Can be implemented; but loading and off-site transportation of large waste volume presents some concerns. (3)	Loading and off-site transportation of large waste volume presents some concerns. Requires specialized equipment. (2)	Loading and off-site transportation of large waste volume presents some concerns. Requires specialized equipment. (2)	Can be implemented with relative ease and using standard construction equipment and methods. (4)
Present Worth Cost	\$23,092,000 (3)	\$33,082,000 (1)	\$26,319,000 (2)	\$12,891,000 to \$14,180,000 (4)
Total Relative Score	(21)	(16)	(19)	(24)
Overall Ranking	2	4	3	1

Notes:

Relative score for each alternative for each criterion is presented in parenthesis.

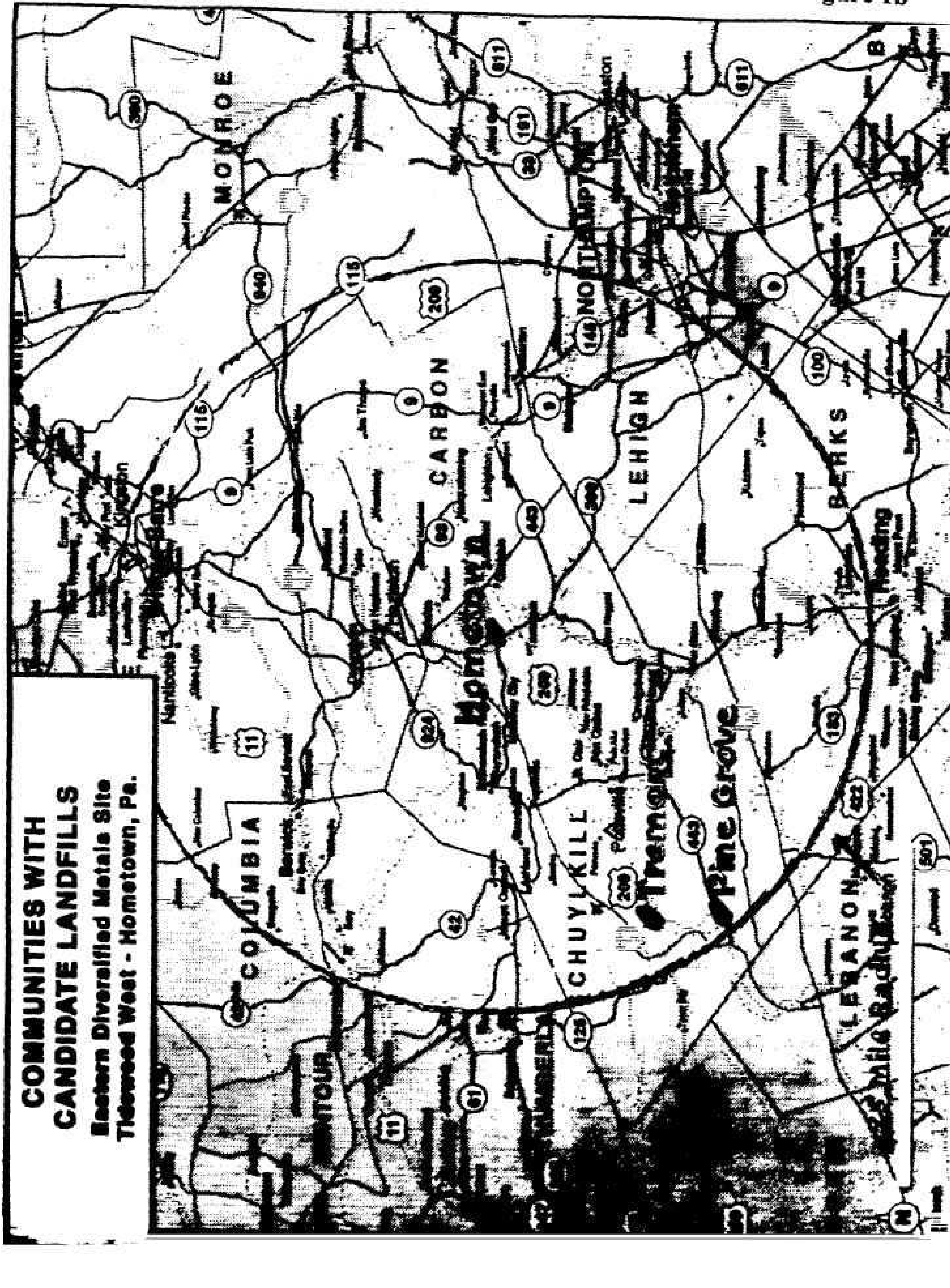
Relative score is based on a ranking scale from 1 through 5 where: 5 = best satisfies criterion; 4 = better than average; 3 = satisfies criterion; 2 = less favorable; and 1 = does not satisfy criterion.

Appendix II

Figure 1a

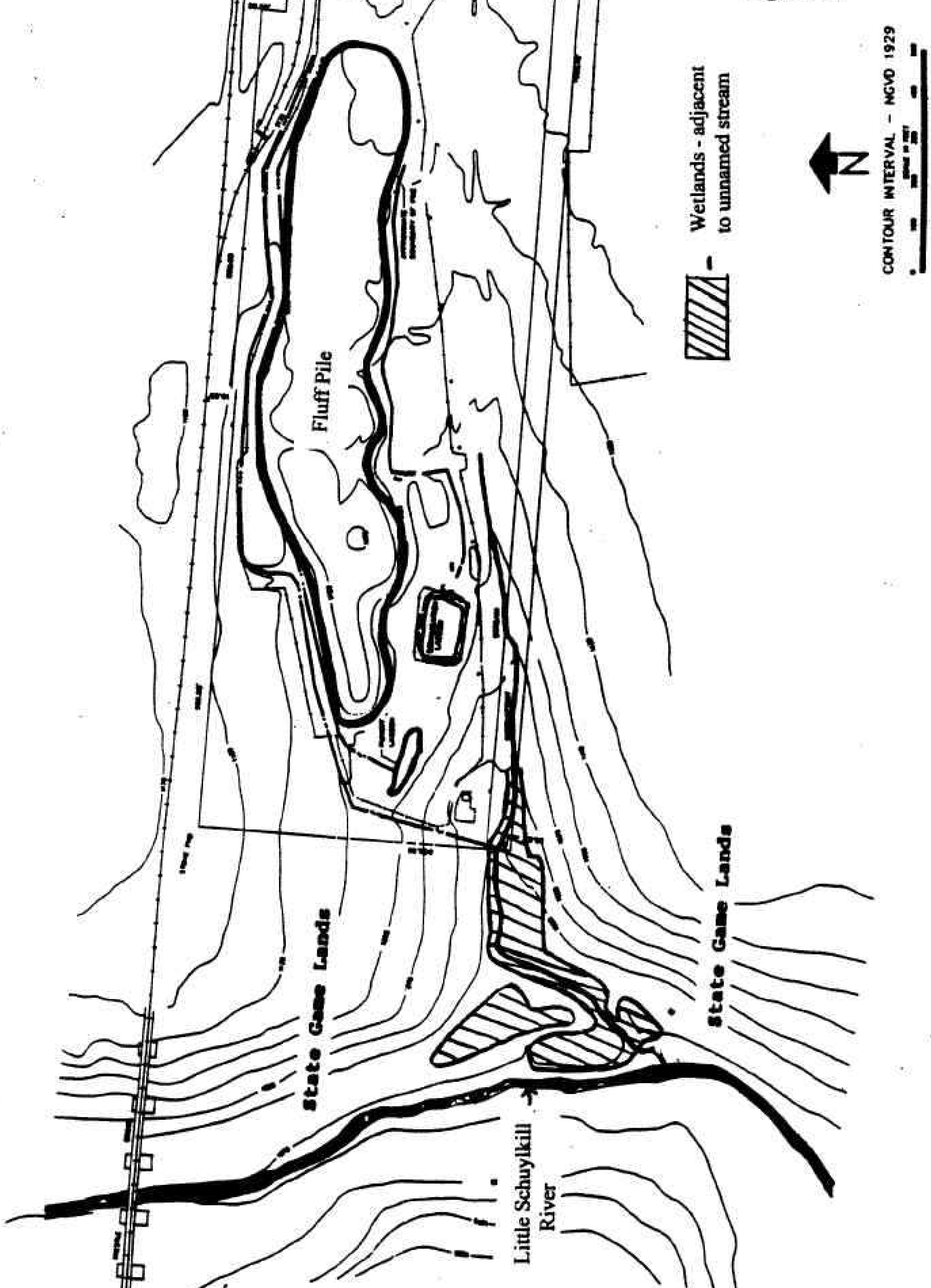
Site Location Map
Eastern Diversified Metals Site
Schuylkill County, Pennsylvania

Figure 1b



COMMUNITIES WITH
CANDIDATE LANDFILLS
Eastern Diversified Metals Site
Tidewood West - Hometown, Pa.
MONROE
CARBON
LEHIGH
BERKS
COLUMBIA
LEBANON
Hometown
Tremont
Pine Grove
Reading
Nanticoke

Figure 2



Fluff Pile
State Game Lands
State Game Lands
Little Schuylkill River
Wetlands - adjacent to unnamed stream
CONTOUR INTERVAL - NGVD 1929

Figure 3

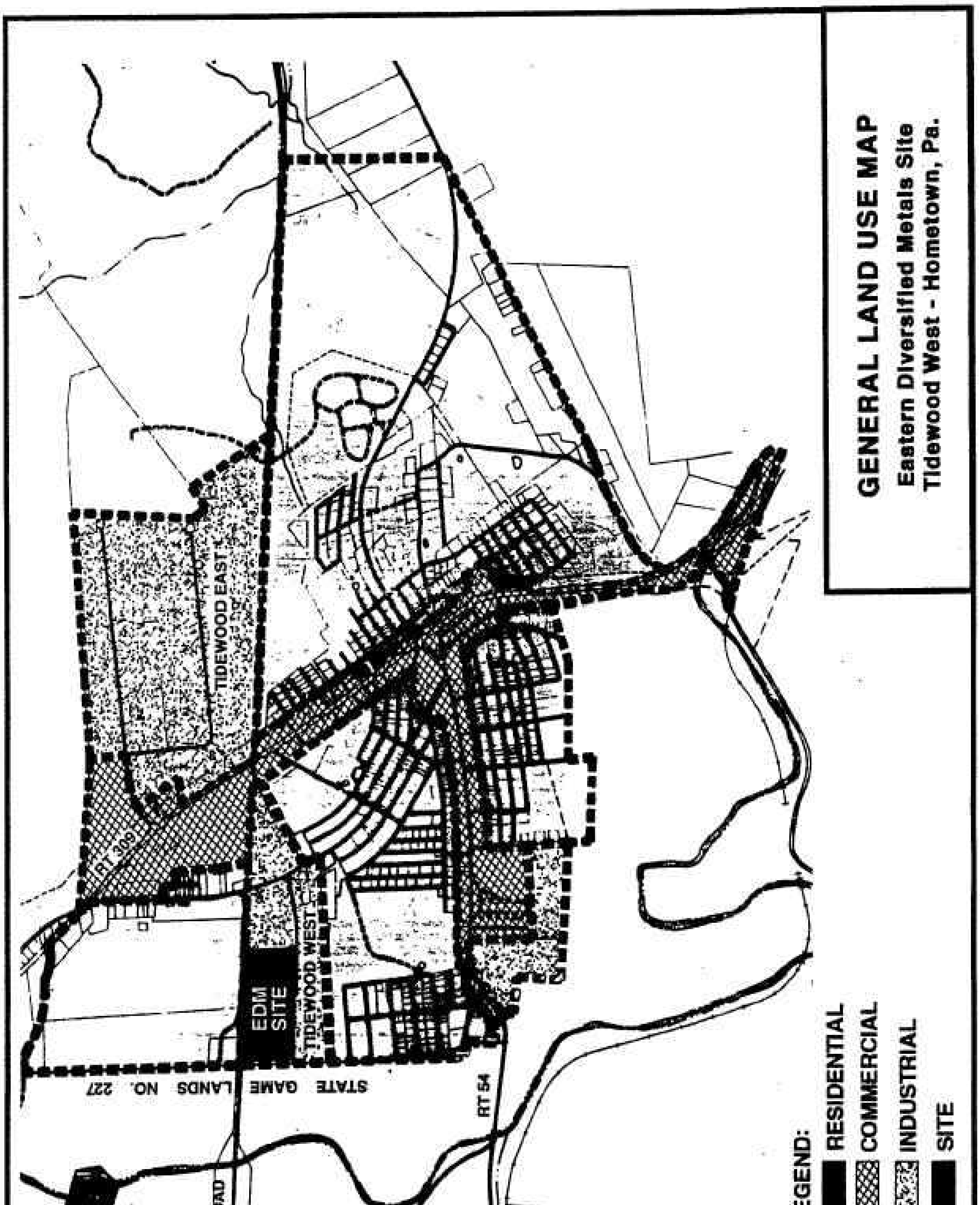
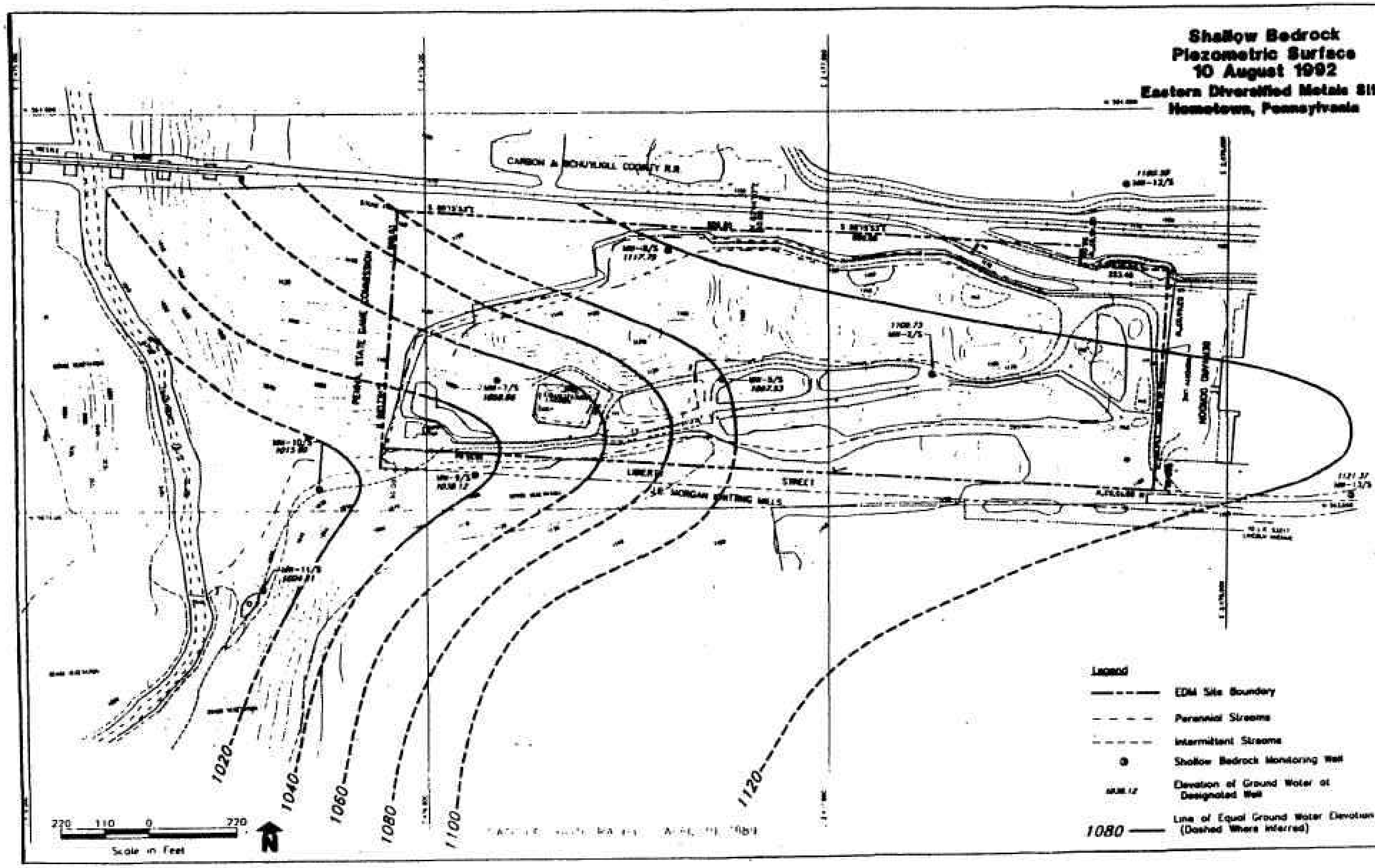
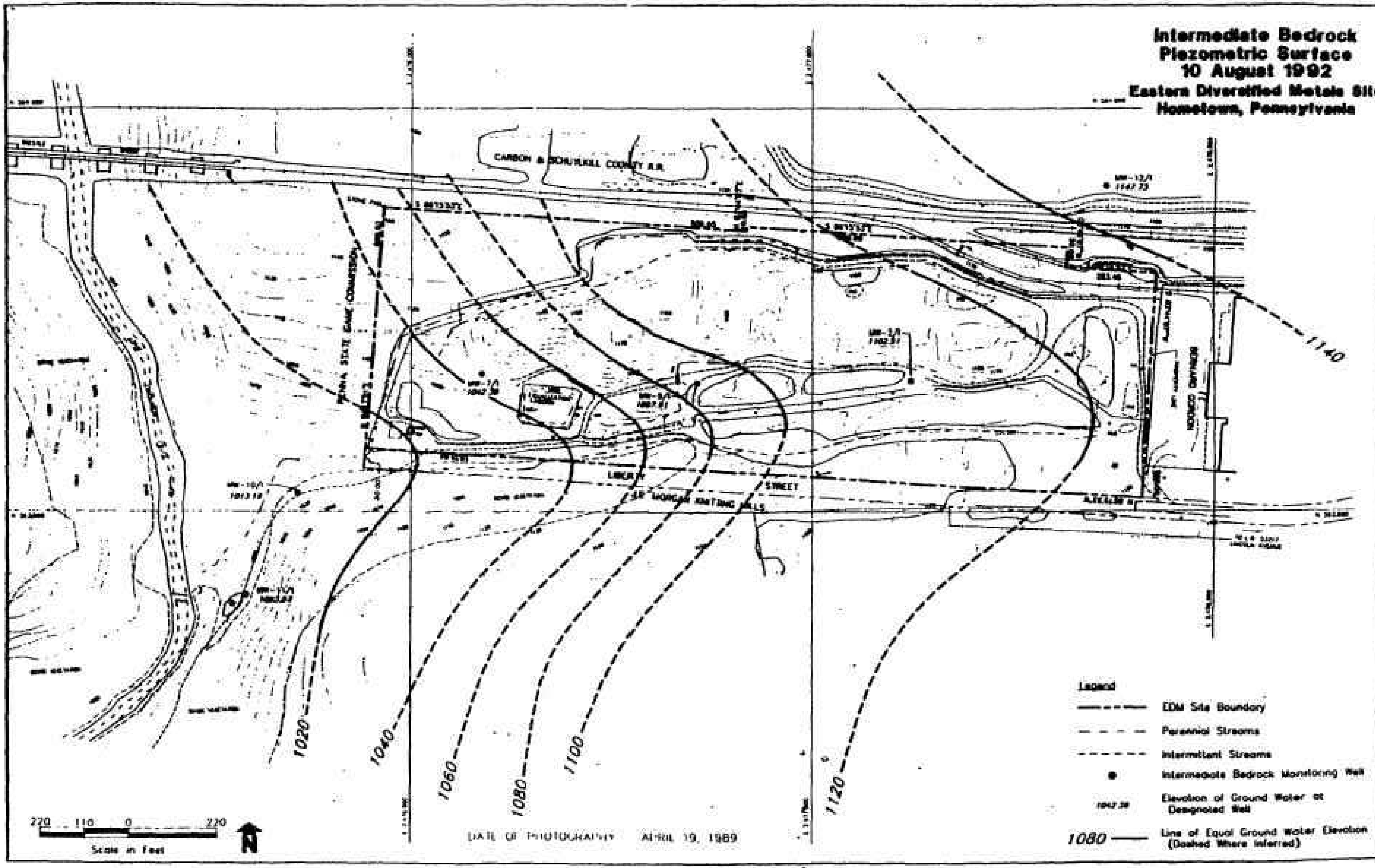

GENERAL LAND USE MAP
Eastern Diversified Metals Site
Tidewood West - Hometown, Pa.
LEGEND:
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
SITE
TIDEWOOD EAST
TIDEWOOD WEST
EDM SITE
RT 309
STATE GAME LANDS NO. 227
RT 54
RAILROAD

Figure 4



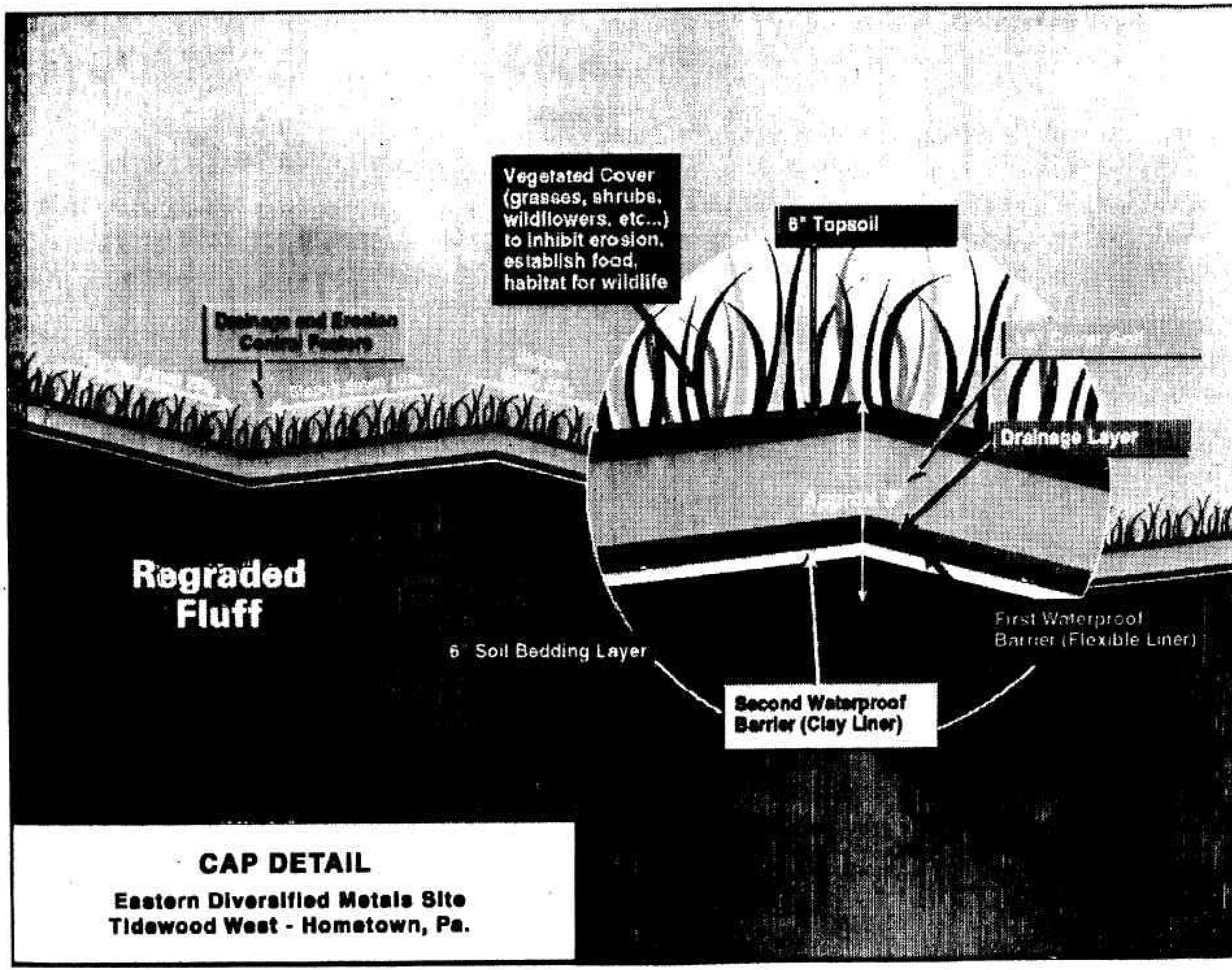
Shallow Bedrock
Piezometric Surface
10 August 1992
Eastern Diversified Metals Site
Hometown, Pennsylvania
CARBON & SCHUYLKILL COUNTY R.R.
PENNA. STATE GAME COMMISSION
LIBERTY STREET
MW-1/S
MW-3/S
1117.79
MW-5/S
MW-2/S
1109.73
MW-12/S
MW-10/S
MW-11/S
MW-13/S
1020
1040
1060
1080
1100
1120
Legend
EDM Site Boundary
Perennial Streams
Intermittent Streams
Shallow Bedrock Monitoring Well
Elevation of Ground Water at Designated Well
1080
Line of Equal Ground Water Elevation (Dashed Where Inferred)
270 110 0 270
Scale in Feet
N

Figure 5



Intermediate Bedrock
Piezometric Surface
10 August 1992
Eastern Diversified Metals Site
Hometown, Pennsylvania
CARBON & SCHUYLKILL COUNTY R.R.
PENNA STATE GAME COMMISSION
BERNARD GORDON
LIBERTY STREET
MORGAN KNITTING MILLS
1020
1040
1060
1080
1100
1120
1140
Legend
EDM Site Boundary
Perennial Streams
Intermittent Streams
Intermediate Bedrock Monitoring Well
Elevation of Ground Water at Designated Well
1080
Line of Equal Ground Water Elevation (Dashed Where Inferred)
220 110 0 220
Scale in Feet
N
DATE OF PHOTOGRAPHY APRIL 19, 1989

Figure 6


Vegetated Cover (grasses, shrubs, wildflowers, etc...) to inhibit erosion, establish food, habitat for wildlife
6" Topsoil
Drainage Layer
Regraded Fluff
6" Soil Bedding Layer
First Waterproof Barrier (Flexible Liner)
Second Waterproof Barrier (Clay Liner)
CAP DETAIL
Eastern Diversified Metals Site
Tidewood West - Hometown, Pa.

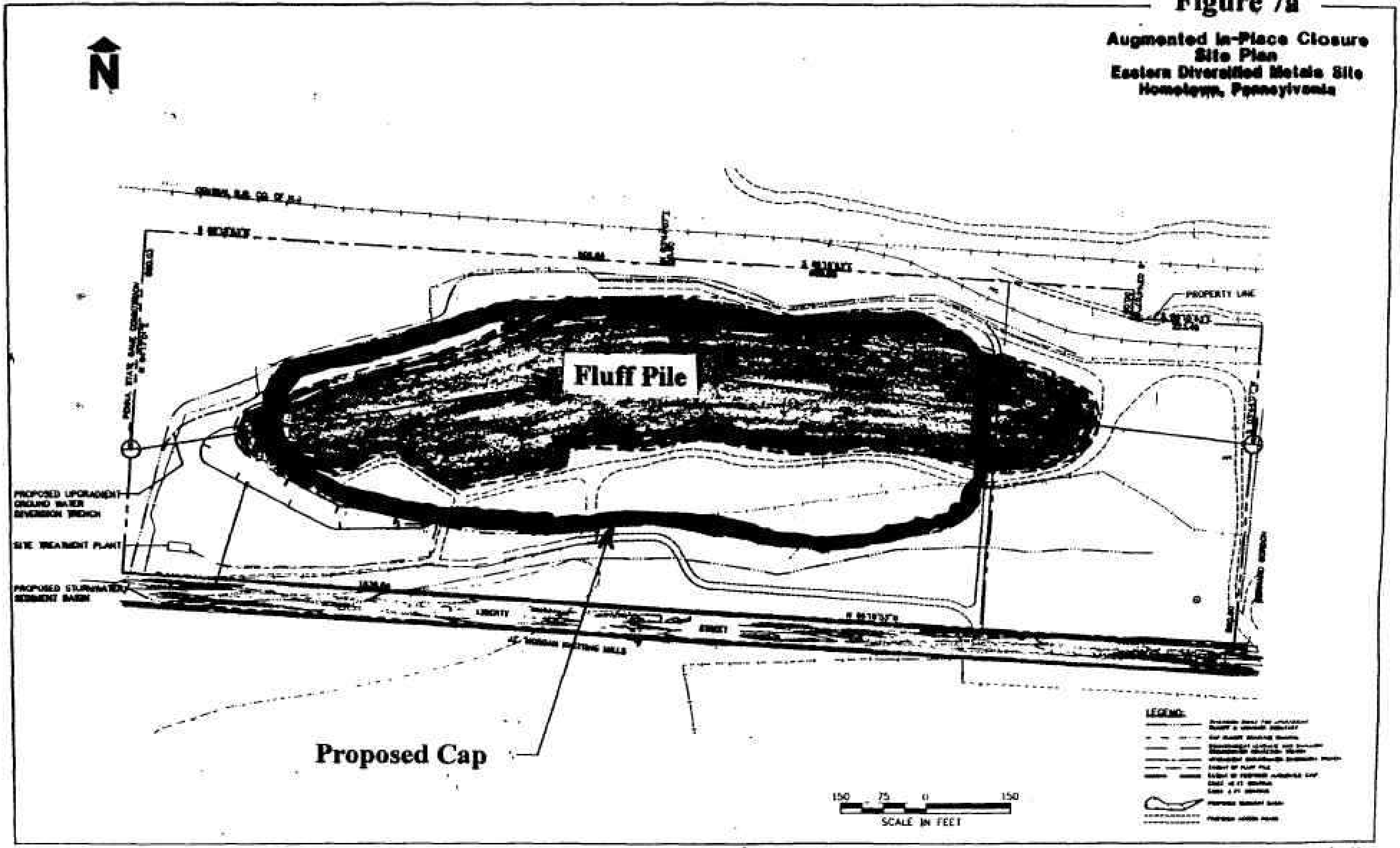


Figure 7a

Augmented In-Place Closure Site Plan Eastern Diversified Metals Site Hometown, Pennsylvania

Figure 7b

Augmented In-Place Closure Site Plan
Eastern Diversified Metals Site
Hometown, Pennsylvania

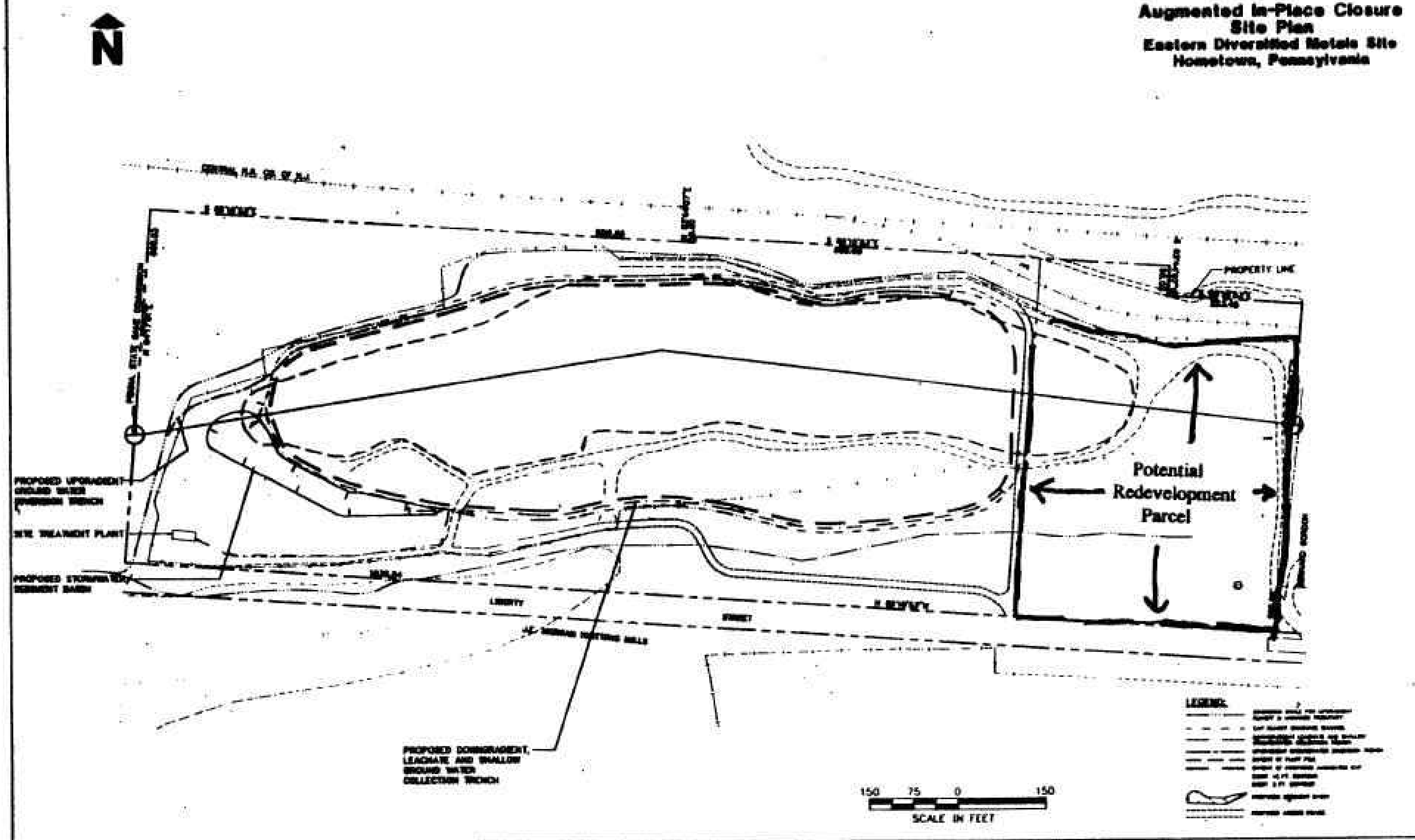


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Figure 8

Augmented In-Place Closure Cross Section
Eastern Diversified Metals Site
Hometown, Pennsylvania

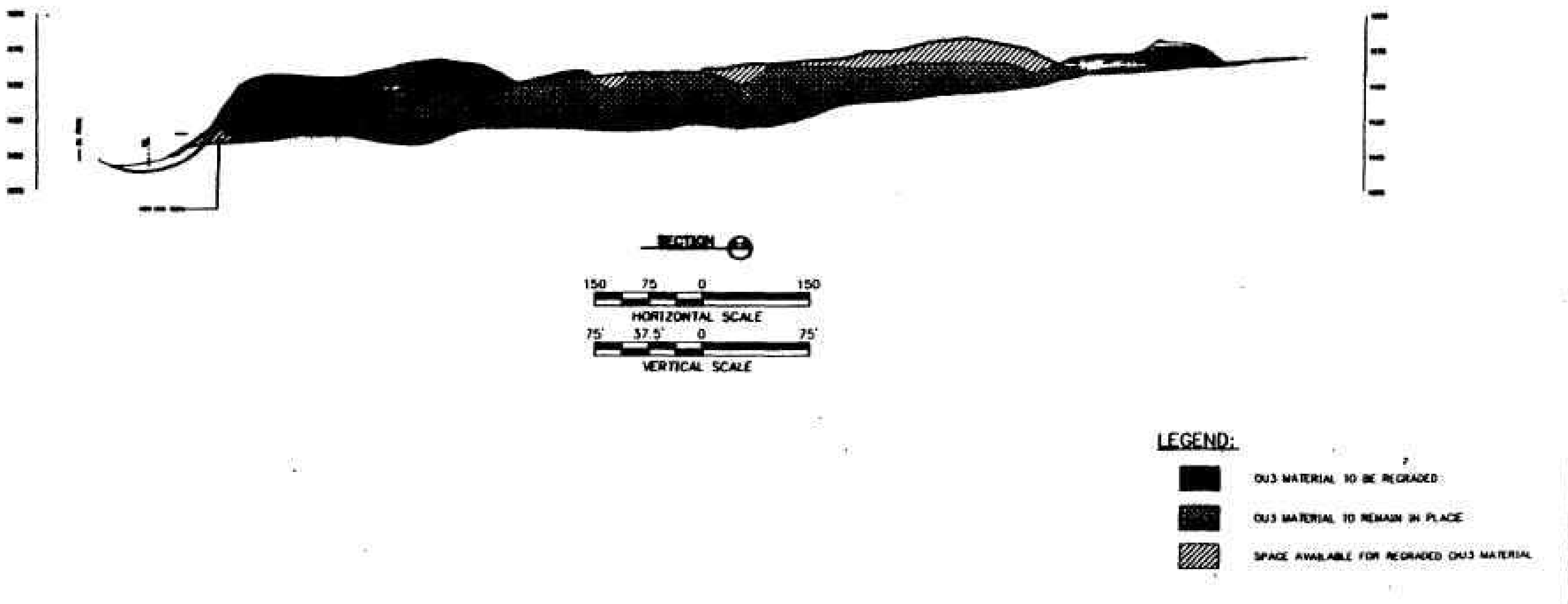
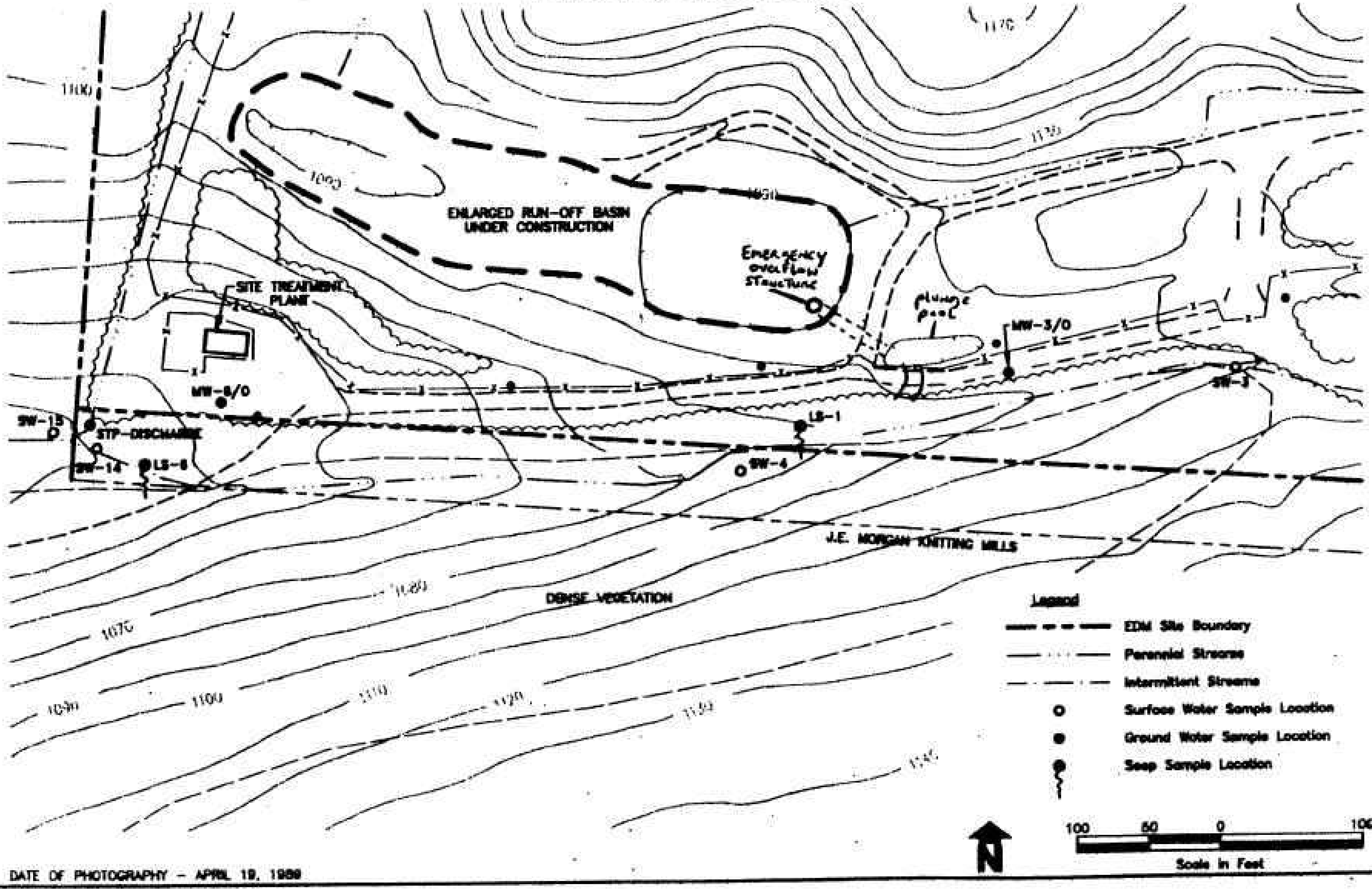


Figure 9

Sample Locations - Confirmation Sampling
Focused Migration Investigation
Eastern Diversified Metals Site
Hometown, Pennsylvania



ERM, INC.

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Appendix III

Table 1 EDM Site
Endangerment Assessment

Routes of Exposures Used to Calculate Potential Intakes

General Routes of Exposure

Potentially Exposed Population	Potential Routes of Exposure		
	Inhalation	**Dermal**	**Ingestion**
Adults	Fugitive Dust	Surface Water Contact Incidental Soil/Fluff Contact	Incidental Surface Water Incidental Soil/Fluff Bioaccumulation (Fish Ingestion)
Children age 6-12	Fugitive Dust	Surface Water Contact Incidental Soil/Fluff Contact	Incidental Surface Water Incidental Soil/Fluff Bioaccumulation (Fish Ingestion)
Children 2-6	Fugitive Dust		Bioaccumulation (Fish Ingestion)

Routes of Exposures Related to Hypothetical Well

Potentially Exposed Population	Potential Routes of Exposure		
	Inhalation	**Dermal**	**Ingestion**
Adults	Bathing	Bathing	Drinking Water
Children age 6-12	Bathing	Bathing	Drinking Water
Children 2-6	Bathing	Bathing	Drinking Water

Table 2
EDM Site Endangerment Assessment
Exposure Point Concentrations

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Average Conc. (ppm)	Maximum Conc. (ppm)	Data Source
Air	Fluff	On-site	Inhalation mg/m3	PCBs	1.27E-06	3.65E-05	TGAI--9/84*
				Dioxin	1.18E-10	1.18E-10	ERM, 1989*
				Zinc	1.31E-05	1.48E-05	TGAI--9/84*
		Off-site residents Hunters and Fisherman	Inhalation mg/m3	PCBs	3.53E-07	1.02E-05	TGAI--9/84*
				Dioxin	3.29E-11	3.29E-11	ERM, 1989*
				Zinc	3.66E-06	4.14E-06	TGAI--9/84*
		Off-site workers (Warehouse)	Inhalation mg/m3	PCBs	2.97E-07	8.56E-06	TGAI--9/84*
				Dioxin	2.77E-11	2.77E-11	ERM 1989*
				Zinc	3.08E-06	3.48E-06	TGAI--9/84*
Ground Water	Fluff Pile	Hypothetical well ● site boundary for Potable water	Ingestion	Manganese	4.18E+00	1.97E+01	ERM, 1989
				Trichloroethene	2.41E-02	9.10E-02	ERM, 1989
				Copper	8.00E-03	4.00E-02	ERM, 1989
				Zinc	4.28E-02	1.69E-01	ERM, 1989
			Dermal contact (Bathing)	Manganese	4.18E+00	1.97E+01	ERM, 1989
				Trichloroethene	2.41E-02	9.10E-02	ERM, 1989
				Copper	8.00E-03	4.00E-02	ERM, 1989
				Zinc	4.26E-02	1.69E-01	ERM, 1989
			Inhalation While Bathing	Manganese	4.18E+00	1.97E+01	ERM, 1989
				Trichloroethene	2.41E-02	9.10E-02	ERM, 1989
				Copper	8.00E-03	4.00E-02	ERM, 1989
				Zinc	4.26E-02	1.69E-01	ERM, 1989
Sediment	Fluff (mixed with sediment)	Off-site (stream)	Dermal contact	Manganese	8.17E+02	3.32E+03	ERM, 1989
				PCBs	2.67E+00	8.40E+00	ERM, 1989
				Copper	5.97E+02	2.22E+03	ERM, 1989
				Zinc	1.59E+02	3.01E+02	ERM, 1989
				DEHP	2.26E+02	7.50E+02	ERM, 1989
			Incidental Ingestion	Manganese	8.17E+02	3.32E+03	ERM, 1989
				PCBs	2.67E+00	8.40E+00	ERM, 1989
				Copper	5.97E+02	2.22E+03	ERM, 1989
				Zinc	1.59E+02	3.01E+02	ERM, 1989
				DEHP	2.26E+02	7.50E+02	ERM, 1989

- **Data used as input to screening model: modeling information is included as an appendix (Appendix C).**

Table 2 (continued)
EDM Site Endangerment Assessment
Exposure Point Concentrations

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Average Conc. (ppm)	Maximum Conc. (ppm)	Data Source
Surface water	Leachate	On-site	Dermal Contact	Manganese	6.23E+00	1.24E+01	ERM, 1989
				PCBs	2.72E-03	6.00E-03	ERM, 1989
				Trichloroethene	1.25E-02	4.40E-02	ERM, 1989
				Copper	1.79E+00	6.39E+00	ERM, 1989
				Zinc	4.15E+00	8.05E+00	ERM, 1989
				DEHP	1.40E-01	1.40E-01	ERM, 1989
	Ground water (&/or Sediment leaching)	Intermittent stream	Dermal contact	Manganese	9.55E-01	2.78E+00	ERM, 1989
				Copper	1.60E-02	3.80E-02	ERM, 1989
				Zinc	1.66E-01	3.69E-01	ERM, 1989
			Incidental Ingestion	Manganese	9.55E-01	2.78E+00	ERM, 1989
				Copper	1.60E-02	3.80E-02	ERM, 1989
				Zinc	1.66E-01	3.69E-01	ERM, 1989
		Little Schuylkill R.	Dermal contact	Manganese	9.55E-01	2.78E+00	ERM, 1989
				Copper	1.60E-02	3.80E-02	ERM, 1989
				Zinc	1.66E-01	3.69E-01	ERM, 1989
			Incidental Ingestion	Manganese	9.55E-01	2.78E+00	ERM, 1989
				Copper	1.60E-02	3.80E-02	ERM, 1989
				Zinc	1.66E-01	3.69E-01	ERM, 1989
			Bioaccumulation (Fish ingestion)	Manganese	9.55E-01	2.78E+00	ERM, 1989
				Copper	1.60E-02	3.80E-02	ERM, 1989
				Zinc	1.66E-01	3.69E-01	ERM, 1989
Soil	Fluff	On-site	Dermal Contact	PCBs	1.93E+02	5.56E+03	TGAI--9/84
				Dioxin	1.85E-02	1.85E-02	ERM, 1989
				Zinc	2.00E+03	2.26E+03	TGAI--9/84
			Incidental Ingestion	Lead	1.18E+04	4.08E+04	TGAI--9/84
				PCBs	1.93E+02	5.56E+03	TGAI--9/84
				Dioxin	1.85E-02	1.85E-02	ERM, 1989
				Zinc	2.00E+03	2.26E+03	TGAI--9/84

Table 2 (continued)
EDM Site Endangerment Assessment
Exposure Point Concentrations

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Average Conc. (ppm)	Maximum Conc. (ppm)	Data Source
Soil (continued)	Surface soil	On-site	Dermal Contact	Manganese	3.67E+02	8.98E+02	ERM, 1989
				PCBs	3.76E+01	2.40E+02	ERM, 1989
				Dioxin	3.57E-03	7.14E-03	ERM, 1989
				Copper	1.20E+01	1.08E+05	ERM, 1989
				Zinc	3.77E+02	1.23E+03	ERM, 1989
				DEHP	1.47E+03	3.30E+03	ERM, 1989
			Incidental Ingestion	Manganese	3.67E+02	8.98E+02	ERM, 1989
				PCBs	3.76E+01	2.40E+02	ERM, 1989
				Dioxin	3.57E-03	7.14E-03	ERM, 1989
				Copper	1.20E+04	1.08E+05	ERM, 1989
				Zinc	3.77E+02	1.23E+03	ERM, 1989
				DEHP	1.47E+03	3.30E+03	ERM, 1989

TABLE 3
EDM SITE SPECIFIC PARAMETERS FOR CALCULATION OF DOSAGE AND INTAKE

		Adult	Child Age 6-12	Child Age 2-6
PHYSICAL CHARACTERISTICS				
Average Body Weight	(a)	70 kg	29 kg	16 kg
Average Skin Surface Area	(a)	18.150 cm2	10.470 cm2	6980 cm2
Average Lifetime	(g)	70 yrs		
Average Number of Years Exposure in Lifetime	(d)	58 yrs	6 yrs	4 yrs
ACTIVITY CHARACTERISTICS				
Inhalation Rate	(f,d)	0.83 m3/hr	0.46 m3/hr	0.25 m3/hr
Retention Rate of Inhaled Air	(i)	75%	75%	75%
Absorption Rate of Inhaled Air	(d)	100%	100%	100%
Frequency of Fugitive Dust Inhalation				
- On-site maintenance workers	(d)	156 days/yr	---	---
- Off-site residents	(d)	365 days/yr	356 days/yr	365 days/yr
- Off-site workers	(d)	260 days/yr	---	---
- Hunters and Fisherman	(d)	14 days/yr	---	---
- Casual Trespassers	(d)		26 days/yr	---
Duration of Fugitive Dust Inhalation				
- On-site maintenance workers	(d)	2 hrs/day	---	---
- Off-site residents	(d)	24 hrs/day	24 hrs/day	24 hrs/day
- Off-site workers	(d)	8 hrs/day	---	---
- Hunters and Fisherman	(d)	4 hrs/day	---	---
- Casual Trespassers	(d)	---	1 hrs/day	---
Amount of Water Ingested Daily	(f)	2 liters	2 liters	2 liters
Percent of Drinking Water From Home Source	(d)	75%	75%	75%
Length of Time Spent Showering/Bathing	(b)	20 min.	20 min.	20 min.
Percentage of Skin Surface Area Immersed While Showering/Bathing	(g)	100%	100%	100%
Volume of Water Used While Showering/Bathing	(b)	200 liters	200 liters	200 liters
Volume of Showerstall	(b)	3 m3	3 m3	3 m3
Length of Time Spent in Bathroom After Showering/Bathing	(b)	10 min.	10 min.	10 min.
Volume of Bathroom	(b)	10 m3	10 m3	10 m3
Amount of Sediment Ingested Incidentally	(f)	---	100 mg	---
Frequency of Sediment Contact				
- Casual trespassers	(d)	---	26 days/yr	---
Duration of Sediment Contact				
- Casual trespassers	(d)	---	1 hr/day	---
Percentage of Skin Area Contacted by Sediment	(d)	20%	20%	---
Skin Absorption Rate of Compounds in Sediment	(c)	0.06	0.12	---
Amount of Water Ingested Incidentally				
- Hunters and Fisherman	(g)	0.2 liters	---	---
- Children Playing	(g)	---	0.05 liters	---
Frequency of Surface Water Contact				
- Hunters and Fisherman	(d)	14 days/yr	---	---
- Children Playing	(d)	---	26 days/yr	---
Duration of Surface Water Contact				
- Hunters and Fisherman	(d)	4 hrs/day	---	---
- Children Playing	(d)	---	1 hr/day	---
Percentage of Skin Surface Area Immersed				
- Hunters and Fisherman	(d)	18%	---	---
- Children Playing	(d)	---	16%	---

TABLE 3 (Continued)
EDM SITE SPECIFIC PARAMETERS FOR CALCULATION OF DOSAGE AND INTAKE

		Adult		Child Age 6-12	Child Age 2-6
ACTIVITY CHARACTERISTICS (Continued)					
Amount of Fish Consumed Daily	(g)	6.5 g/day		6.5 g/day	6.5 g/day
Amount of Soil Ingested Incidentally	(f)	50 mg		50 mg	---
Amount of Fluff Ingested Incidentally	(f)	50 mg		50 mg	---
Frequency of Soil/Fluff Contact					
-On-site maintenance workers	(d)	156 days/yr		---	---
-Casual trespassers	(d)	---		26 days/yr	---
Duration of Soil/Fluff Contact					
-On-site maintenance workers	(d)	2 hrs/day		---	---
-Casual trespassers	(d)	---		1 hr/day	---
Percentage of Skin Area Contacted by Soil/Fluff	(d)	20%		20%	---
Skin Absorption Rate of Compounds in Soil/Fluff	(c)	0.06		0.12	---
MATERIAL CHARACTERISTICS					
Dust Adherence, Soil	(e)	0.51 mg/cm2	*		
Dust Adherence, Fluff	(l)	1.45 mg/cm2	**		
Soil Matrix Effect	(c)	15%			
Mass Flux Rate (water-based)	(g)	0.5 mg/cm2/hr			
BIOCONCENTRATION FACTORS					
Lead	(f)	49 L/kg			
Manganese	(k)	100 L/kg			
Copper	(f)	200 L/kg			
Zinc	(f)	47 L/kg			
CHEMICAL SPECIFIC ABSORPTION FACTORS					
Dioxin (in fluff and soil: ingestion only)	(h)	0.3	***		
PCBs (in sediment, fluff, and soil: ingestion only)	(h)	0.3	***		
Lead (in sediment and soil: ingestion only)	(j)	0.3			
Lead (in fluff, based on absorbable fraction:	(App. l)	0.27		(most probable intake)	
inhalation of fugitive dust and ingestion only)		0.55		(maximum intake)	
(All other absorption rates are assumed to be 100%).					

a - Anderson. E., Browne. N., Duletsky, S., Warn. T., "Development of Statistical Distributions or Ranges of Standard Factors Used in Exposure Assessments", PB 85-242667/AS. US EPA. Office of Health and Environmental Assessment. 1984.
b - K.G. Symms, "An approximation of the inhalation exposure to volatile sythetic organic chemicals from showering with contaminated household water." paper presented at the symposium of the American College of Toxicologists. 15 November 1986.
c - J.K. Hawley, "Assessment of Health Risk from Exposure to Contaminated Soil", Risk Analysis, Vol. 5. No. 4. 1985
d - ERM Staff Professional Judgement
e - Lepow, M.L., Bruckman, L., Gillette, M., Markowitz, S., Robino, R., Kapish, J., "Investigations into Sources of Lead in the Environment of Urban Children", Environmental Research 10:415-426, 1975, and
Lepow, M.L., Bruckman, M., Robino, L., Markowitz, S., Gillette, R., Kapish, J., "Role of Airborne Lead in Increased Body Burden of Lead in Hartford Children", Environmental Health Perspectives 6:99-101, 1974
f - Superfund Public Health Evaluation Manual
g - Superfund Exposure Assessment Manual
h - Kimbrough R. Falk H. Sterro P. Frieo G. 1984. "Health implications of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) contamination of residential soul", Journal of Toxicology an Environmental Health 14:47-93.
i - Lipsky, D. 1989. Health Hazards Associated with PCDD and PCDF Emissions. Found in: The Risk Assessment of Environmental Hazards, D.J. Paustenbach, ed., New York: John Wiley and Sons, pp. 631 - 686.
j - Beck, B.D. S. Hala B.L. Murphy, 1989. Evaluation of Soil Ingestion Rates. Cambridge. MA: Gradient Corp.
k - U.S. EPA. "Health Assessment Document for Manganese", EPA 600/8-83-013F. 1984.
l - Human Health Evaluation Manual, July 1989.

*0.51 mg/cm2 was used to calculate dermal contact in soil, because the soil at the EDM site is the same general soil type as in the Lepow, et. al research study (reference e). This dust adherence value was derived from the recovery rates and area of the skin dust collector used in the study.
**1.45 mg/cm2 was used to calculate dermal contact in the fluff due to lack of more specific results for dust adherence of fluff.
***30% intestinal absorption used as best estimate of exposure to PCBs and dioxin for most probable scenarios: 100% absorption used for calculation of exposure maxima.

Table 4
Summary of Toxicological Information
For the Indicator Chemicals
EDM Site

Indicator Chemical	Oral RfD* mg/kg/day	Inhalation RfD* mg/kg/day	Oral CPF** l/mg/kg/day	Inhalation CPF** l/mg/kg/day	EPA Carcinogen Classification	Reference
Copper	3.70E-02	1.00E-02	NA	NA	D	SPHEM
Lead	withdrawn	withdrawn	NA	NA	B2	IRIS
Manganese	2.00E-01	3.00E-04	NA	NA	D	SPHEM
Zinc	2.10E-01	1.00E-02	NA	NA	D	SPHEM
Dioxins	NA	NA	1.56E+05	1.56E+05	B2	SPHEM
Bis(2-ethylhexyl)phthalate	2.00E-02	NA	1.40E-02	NA +	B2	IRIS
Polychlorinated Biphenyls (PCBs)	NA	NA	7.70E+00	7.70E+00	B2	IRIS
Trichloroethene	NA	NA	1.10E-02	1.30E-02	B2	IRIS

*Noncarcinogenic effects
**Carcinogenic effects

+No inhalation pathway; therefore, use of Oral CPF for Inhalation CPF is not needed.

RfD - Reference Dose
CPF - Carcinogenic Potency Factor

NA - Not Available

IRIS - EPA's On-Line Integrated Risk Information System accessed 7/89.
SPHEM - Superfund Public Health Evaluation Manual 10/86.

Table 5 EDM Site
Endangerment Assessment
Important Fate and Transport Processes for
Indicator Compounds

Indicator Compound	Major Fate and Transport Processes*
Lead	Sorption Bioaccumulation Chemical speciation Biotransformation
Manganese	Sorption Complexation Oxidation Bioaccumlation
Polychlorinated Biphenyls (PCBs)	Photolysis Hydrolysis Sorption Bioaccumulation Biotransformation (<4 chlorine per molecule) Volatilization
Dioxins	Sorption Bioaccumulation Photochemical transformation
Trichloroethene (TCE)	Biotransformation/degradation Volatilization Bioaccumulation Oxidation
Copper	Sorption Bioaccumulation Complex formation
Zinc	Sorption Bioaccumulation
Bis-(2-Ethylhexyl)phthalate (DEHP)	Sorption Biodegradation Bioaccumulation

Table 6
EDM Site Endangerment Assessment
Calculation of Noncarcinogenic Hazard Indices
(Adult Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Reference Dose	Most Probable Hazard Index	Maximum Hazard Index
Air	Fluff	On-site Maintenance Workers	Inhalation	PCBs	9.65E-09	2.77E-07	NA	NA	NA
				Dioxin	8.97E-13	8.97E-13	NA	NA	NA
				Zinc	9.96E-08	1.13E-07	1.00E-02	9.96E-06	1.13E-05
					Total hazard, this exposure point:			9.96E-06	1.13E-05
		Off-site residents	Inhalation	PCBs	7.53E-08	2.18E-06	NA	NA	NA
				Dioxin	7.02E-12	7.02E-12	NA	NA	NA
				Zinc	7.81E-07	8.84E-07	1.00E-02	7.81E-05	8.84E-05
					Total hazard, this exposure point:			7.81E-05	8.84E-05
		Off-site workers (Warehouse)	Inhalation	PCBs	1.51E-08	4.34E-07	NA	NA	NA
				Dioxin	1.40E-12	1.40E-12	NA	NA	NA
				Zinc	1.56E-07	1.76E-07	1.00E-02	1.56E-05	1.76E-05
					Total hazard, this exposure point:			1.56E-05	1.76E-05
		Hunters and fishermen	Inhalation	PCBs	4.02E-10	1.39E-08	NA	NA	NA
				Dioxin	4.49E-14	4.49E-14	NA	NA	NA
				Zinc	4.90E-09	5.65E-09	1.00E-02	4.90E-07	5.65E-07
					Total hazard, this exposure point:			4.90E-07	5.65E-07
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	8.95E-02	4.22E-01	2.00E-01	4.47E-01	2.11E+00
				Trichloroethene	5.18E-04	1.95E-03	NA	NA	NA
				Copper	1.71E-04	8.56E-04	3.70E-02	4.63E-03	2.31E-02
				Zinc	9.12E-04	3.62E-03	2.10E-01	4.34E-03	1.72E-02
			Dermal contact (Bathing)	Manganese	1.79E-04	8.43E-04	2.00E-01	8.95E-04	4.22E-03
				Trichloroethene	1.03E-06	3.89E-06	NA	NA	NA
				Copper	3.42E-07	1.71E-06	3.70E-02	9.25E-06	4.63E-05
				Zinc	1.82E-06	7.23E-06	2.10E-01	8.68E-06	3.44E-05
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	4.10E-03	1.55E-02	NA	NA	NA
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
					Total hazard, this exposure point:			4.87E-01	2.18E+00
Surface water	Ground water (&/or Sediment leaching)	Little Schuylkill R. Hunters and Fishermen	Dermal contact	Manganese	3.47E-06	1.01E-05	2.00E-01	1.73E-05	5.05E-05
				Copper	5.81E-08	1.38E-07	3.70E-02	1.57E-06	3.73E-06
				Zinc	6.04E-07	1.34E-06	2.10E-01	2.88E-06	6.38E-06
			Incidental ingestion	Manganese	1.05E-04	3.05E-04	2.00E-01	5.23E-04	1.52E-03
				Copper	1.75E-06	4.16E-06	3.70E-02	4.74E-05	1.13E-04
				Zinc	1.82E-05	4.04E-05	2.10E-01	8.68E-05	1.93E-04
					Total hazard, this exposure point:			6.79E-04	1.88E-03

NA - Not Applicable

AR300289

Table 6 (continued)
EDM Site Endangerment Assessment
Calculation of Noncarcinogenic Hazard Indices
(Adult Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Reference Dose	Most Probable Hazard Index	Maximum Hazard Index
Surface water continued...	Ground water (&/or Sediment leaching)	Little Schuylkill R.	Bioaccumulation (Fish ingestion)	Manganese	8.87E-03	2.58E-02	2.00E-01	4.43E-02	1.29E-01
				Copper	2.97E-04	7.06E-04	3.70E-02	8.03E-03	1.91E-02
				Zinc	7.26E-04	1.61E-03	2.10E-01	3.46E-03	7.87E-03
					Total hazard, this exposure point:			6.60E-02	1.64E-01
Soil	Fluff	On-site Maintenance Workers	Dermal Contact	PCBs	1.12E-04	3.22E-03	NA	NA	NA
				Dioxin	1.07E-08	1.07E-08	NA	NA	NA
				Zinc	1.16E-03	1.30E-03	2.10E-01	5.52E-03	6.19E-03
			Incidental ingestion	PCBs	1.76E-05	1.02E-03	NA	NA	NA
				Dioxin	1.60E-09	3.38E-09	NA	NA	NA
				Zinc	6.10E-04	4.13E-04	2.10E-01	2.90E-03	1.97E-03
					Total hazard, this exposure point:			8.42E-03	8.16E-03
	Surface soil	On-site Maintenance Workers	Dermal contact	Manganese	7.48E-05	1.83E-04	2.00E-01	3.74E-04	9.15E-04
				PCBs	7.66E-08	4.80E-05	NA	NA	NA
				Dioxin	7.28E-10	1.46E-09	NA	NA	NA
				Copper	2.45E-06	2.20E-02	3.70E-02	6.61E-05	5.95E-01
				Zinc	7.68E-05	2.51E-04	2.10E-01	3.66E-04	1.19E-03
				DEHP	2.99E-04	6.73E-04	2.00E-02	1.50E-02	3.36E-02
			Incidental ingestion	Manganese	1.12E-04	5.47E-04	2.00E-01	5.59E-04	2.74E-03
				PCBs	3.44E-08	1.46E-04	NA	NA	NA
				Dioxin	3.28E-10	4.35E-09	NA	NA	NA
				Copper	3.66E-03	6.58E-02	3.70E-02	9.88E-02	1.78E+00
				Zinc	1.15E-04	7.50E-04	2.10E-01	5.47E-04	3.57E-03
				DEHP	4.47E-04	2.01E-03	2.00E-02	2.24E-02	1.01E-01
					Total hazard, this exposure point: (on-site maintenance workers)			1.34E-01	2.52E+00

NA - Not applicable

Total hazard for on-site maintenance workers:	1.46E-01	2.52E+00
Total hazard for off-site residents (includes hunting & fishing scenario):	5.14E-01	2.91E+00
Total hazard for off-site workers:	1.56E-06	1,76E-06
Total hazard for hunters & fisherman:	5.86E-02	1.58E-01

Note: 100 mg/day was used in calculating ingestion of Surface soil and Fluff for maximum exposure; only the worst of the two was used in the total maximum hazard calculation.

AR300290

Table 7
EDM Site Endangerment Assessment
Calculation of Noncarcinogenic Hazard Indices
(Child 6-12 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Reference Dose	Most Probable Hazard Index	Maximum Hazard Index
Air	Fluff	On-site	Inhalation	PCBs	1.08E-09	3.09E-08	NA	NA	NA
				Dioxin	1.00E-13	1.00E-13	NA	NA	NA
				Zinc	1.11E-08	1.25E-08	1.00E-02	1.11E-06	1.25E-06
				Total hazard, this exposure point:				1.11E-06	1.25E-06
		Off-site residents	Inhalation	PCBs	1.01E-07	2.91E-06	NA	NA	NA
				Dioxin	9.30E-12	9.30E-12	NA	NA	NA
				Zinc	8.79E-07	9.94E-07	1.00E-02	8.79E-05	9.94E-05
				Total hazard, this exposure point:				8.79E-05	9.94E-05
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	2.17E-01	1.02E+00	2.00E-01	1.09E+00	5.12E+00
				Trichloroethene	1.25E-03	4.73E-03	NA	NA	NA
				Copper	4.18E-04	2.08E-03	3.70E-02	1.12E-02	5.62E-02
				Zinc	2.22E-03	8.79E-03	2.10E-01	1.05E-02	4.18E-02
			Dermal contact (Bathing)	Manganese	2.51E-04	1.18E-03	2.00E-01	1.25E-03	5.91E-03
				Trichloroethene	1.45E-06	5.46E-06	NA	NA	NA
				Copper	4.80E-07	2.40E-06	3.70E-02	1.30E-05	6.49E-05
				Zinc	2.56E-06	1.01E-05	2.10E-01	1.22E-05	4.83E-05
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	5.54E-03	2.09E-02	NA	NA	NA
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
				Total hazard, this exposure point: (residential use of ground water)				1.11E+00	5.23E+00
Sediment	Fluff (mixed with sediment)	Off-site (stream)	Dermal contact	Manganese	3.82E-05	1.55E-04	2.00E-01	1.91E-04	7.77E-04
				PCBs	1.25E-07	3.93E-07	NA	NA	NA
				Copper	2.79E-05	1.04E-04	3.70E-02	7.55E-04	2.81E-03
				Zinc	7.44E-06	1.41E-05	2.10E-01	3.54E-05	6.71E-05
				DEHP	1.06E-05	3.51E-05	2.00E-02	5.29E-04	1.76E-03
			Incidental ingestion	Manganese	2.01E-04	8.15E-04	2.00E-01	1.00E-03	4.08E-03
				PCBs	1.86E-07	6.19E-07	NA	NA	NA
				Copper	1.47E-04	5.45E-04	3.70E-02	3.96E-03	1.47E-02
				Zinc	3.91E-05	7.39E-05	2.10E-01	1.86E-04	3.52E-04
				DEHP	5.54E-05	1.84E-04	2.00E-02	2.77E-03	9.21E-03
				Total hazard, sediment, this exposure point:				9.49E-03	2.98E-02
Surface water	Leachate	On-site	Dermal Contact	Manganese	1.28E-05	2.55E-05	2.00E-01	6.41E-05	1.28E-04
				PCBs	5.60E-09	1.23E-08	NA	NA	NA
				Trichloroethene	2.57E-08	9.05E-08	NA	NA	NA
				Copper	3.68E-06	1.31E-05	3.70E-02	9.95E-05	3.55E-04
				Zinc	8.54E-06	1.46E-05	2.10E-01	4.07E-05	7.89E-05
				DEHP	2.88E-07	2.88E-07	2.00E-02	1.44E-05	1.44E-05
				Total hazard, leachate, this exposure point:				2.18E-04	5.78E-04

NA - Not Applicable

ble 7 (continued)
EDM Site Endangerment Assessment
Calculation of Noncarcinogenic Hazard Indices
(Child 6-12 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Reference Dose	Most Probable Hazard Index	Maximum Hazard Index
Surface Water continued...	Ground water (&/or Sediment leaching)	Intermittent stream	Dermal contact	Manganese	1.96E-06	5.72E-06	2.00E-01	9.82E-06	2.86E-05
				Copper	3.29E-08	7.82E-08	3.70E-02	8.90E-07	2.11E-06
				Zinc	3.42E-07	7.59E-07	2.10E-01	1.63E-06	3.62E-06
			Incidental ingestion	Manganese	1.17E-04	3.41E-04	2.00E-01	5.86E-04	1.71E-03
				Copper	1.97E-06	4.67E-06	3.70E-02	5.31E-05	1.26E-04
				Zinc	2.04E-05	4.53E-05	2.10E-01	9.73E-05	2.16E-04
				Total hazard, stream water, this exposure point:				7.49E-04	2.06E-03
		Little Schuylkill R.	Dermal contact	Manganese	1.96E-06	5.72E-06	2.00E-01	9.82E-06	2.86E-05
				Copper	3.29E-08	7.82E-08	3.70E-02	8.90E-07	2.11E-06
				Zinc	3.42E-07	7.59E-07	2.10E-01	1.63E-06	3.62E-06
			Incidental ingestion	Manganese	1.17E-04	3.41E-04	2.00E-01	5.86E-04	1.71E-03
				Copper	1.97E-06	4.67E-06	3.70E-02	5.31E-05	1.26E-04
				Zinc	2.04E-05	4.53E-05	2.10E-01	9.73E-05	2.16E-04
				Total hazard, river water, this exposure point:				7.49E-04	2.06E-03
		Little Schuylkill R.	Bioaccumulation (Fish ingestion)	Manganese	2.14E-02	6.23E-02	2.00E-01	1.07E-01	3.12E-01
				Copper	7.17E-04	1.70E-03	3.70E-02	1.94E-02	4.60E-02
				Zinc	1.75E-03	3.89E-03	2.10E-01	8.35E-03	1.85E-02
				Total hazard, bioaccumulation, this exposure point:				1.36E-01	3.76E-01
Soil	Fluff	On-site	Dermal Contact	PCBs	2.57E-06	7.40E-04	NA	NA	NA
				Dioxin	2.46E-09	2.46E-09	NA	NA	NA
				Zinc	2.66E-04	3.01E-04	2.10E-01	1.27E-03	1.43E-03
			Incidental ingestion	PCBs	7.11E-06	1.37E-03	NA	NA	NA
				Dioxin	6.82E-10	4.54E-09	NA	NA	NA
				Zinc	2.46E-04	5.55E-04	2.10E-01	1.17E-03	2.64E-03
				Total hazard, fluff, this exposure point:				2.44E-03	4.06E-03
	Surface soil	On site	Dermal contact	Manganese	1.72E-05	4.20E-05	2.00E-01	8.59E-05	2.10E-04
				PCBs	1.78E-06	1.12E-05	NA	NA	NA
				Dioxin	1.87E-10	3.34E-10	NA	NA	NA
				Copper	5.62E-07	5.05E-03	3.70E-02	1.52E-05	1.37E-01
				Zinc	1.78E-05	5.76E-05	2.10E-01	8.40E-05	2.74E-04
				DEHP	6.87E-05	1.54E-04	2.00E-02	3.43E-03	7.72E-03
			Incidental ingestion	Manganese	4.51E-05	2.21E-04	2.00E-01	2.25E-04	1.10E-03
				PCBs	1.39E-06	5.90E-05	NA	NA	NA
				Dioxin	1.32E-10	1.76E-09	NA	NA	NA
				Copper	1.47E-03	2.65E-02	3.70E-02	3.98E-02	7.17E-01
				Zinc	4.63E-05	3.02E-04	2.10E-01	2.20E-04	1.44E-03
				DEHP	1.80E-04	8.11E-04	2.00E-02	9.01E-03	4.05E-02
				Total hazard, soil, this exposure point:				6.29E-02	9.06E-01
				Total hazard, all exposure points:				1.31E+00	6.55E+00

Note: 100 mg/day was used in calculating ingestion of Surface soil and Fluff for maximum exposure; only the worst of the two was used in the total maximum hazard calculation.

AR300292

Table 8
EDM Site Endangerment Assessment
Calculation of Noncarcinogenic Hazard Indices
(Child 2-6 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Reference Dose	Most Probable Hazard Index	Maximum Hazard Index
Air	Fluff	Off-site residents	Inhalation	PCBs	9.93E-08	2.67E-06	NA	NA	NA
				Dioxin	8.25E-12	8.25E-12	NA	NA	NA
				Zinc	1.03E-06	1.10E-06	1.00E-02	1.03E-04	1.10E-04
					Total hazard, this exposure point:			1.03E-04	1.10E-04
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	3.93E-01	1.85E+00	2.00E-01	1.96E+00	9.26E+00
				Trichloroethene	2.27E-03	8.55E-03	NA	NA	NA
				Copper	7.52E-04	3.78E-03	3.70E-02	2.03E-02	1.02E-01
				Zinc	4.00E-03	1.59E-02	2.10E-01	1.91E-02	7.56E-02
			Dermal contact (Bathing)	Manganese	3.01E-04	1.42E-03	2.00E-01	1.50E-03	7.09E-03
				Trichloroethene	1.74E-06	6.55E-06	NA	NA	NA
				Copper	5.76E-07	2.88E-06	3.70E-02	1.56E-05	7.78E-05
				Zinc	3.07E-06	1.22E-05	2.10E-01	1.46E-05	5.79E-05
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	5.30E-03	2.00E-02	NA	NA	NA
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
					Total hazard, this exposure point:			2.01E+00	9.44E+00
Surface Water	Ground Water (&/or Sediment leaching)	Little Schuylkill R.	Bioaccumulation (Fish ingestion)	Manganese	3.88E-02	1.13E-01	2.00E-01	1.94E-01	5.65E-01
				Copper	1.30E-03	3.08E-03	3.70E-02	3.51E-02	8.79E-02
				Zinc	3.18E-03	7.05E-03	2.10E-01	1.51E-02	4.68E-01
					Total hazard, this exposure point:			2.44E-01	1.12E+00
					Total hazard, all exposure points:			2.25E+00	1.06E+01

NA - Not applicable

AR300293

Table 9
EDM Site Endangerment Assessment
Theoretical Noncarcinogenic Hazard Indices

	Most Probable Noncarcinogenic Hazard Index	Maximum Noncarcinogenic Hazard Index
Adults, off-site residents	5.14E-01	2.31E+00
Children, age 6-12	1.31E+00	6.55E+00
Children, age 2-6	2.25E+00	1.06E+01

Note:
The exposure pathways included in these calculations are listed below.

All ages: off-site fugitive dust (predicted by air model)
fish ingestion (theoretical bioaccumulation)
residential use of hypothetical downgradlent well water

Adults: additional off-site fugitive dust as hunters and fishermen

Adults.
Children 6-12: off-site recreational exposure to river water

Children 6-12: off-site recreational exposure to intermittent stream water and sediment on-site recreational exposure to surface soil, fluff, and leachate (fence-down scenario)

It should be noted that some of these pathways are hypothetical and do not represent actual exposures under current conditions.

Table 10
EDM Site Endangerment Assessment
Calculation of Carcinogenic Risk
(Adult Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Carcinogenic Potency Factor (CPF)	Most Probable Carcinogenic Risk	Maximum Carcinogenic Risk
Air	Fluff	On-site Maintenance Workers	Inhalation	PCBs	9.65E-09	2.77E-07	7.70E+00	7.43E-08	2.14E-06
				Dioxin	8.97E-13	8.97E-13	1.56E+05	1.40E-07	1.40E-07
				Zinc	8.06E-09	1.13E-07	NA	NA	NA
						Total risk, this exposure point:		2.14E-07	2.28E-06
		Off-site residents	Inhalation	PCBs	7.53E-08	2.18E-06	7.70E+00	5.80E-07	1.68E-05
				Dioxin	5.91E-12	5.91E-12	1.56E+05	9.22E-07	9.22E-07
				Zinc	6.57E-07	7.43E-07	NA	NA	NA
						Total risk, this exposure point:		1.50E-06	1.77E-05
		Off-site workers (Warehouse)	Inhalation	PCBs	1.51E-08	4.34E-07	7.70E+00	1.16E-07	3.34E-06
				Dioxin	1.40E-12	1.40E-12	1.56E+05	2.18E-07	2.18E-07
				Zinc	1.56E-07	1.78E-07	NA	NA	NA
						Total risk, this exposure point:		3.35E-07	3.56E-06
		Hunters and fishermen	Inhalation	PCBs	4.82E-10	1.39E-08	7.70E+00	3.71E-09	1.07E-07
				Dioxin	3.78E-14	3.78E-14	1.56E+05	5.90E-09	5.90E-09
				Zinc	4.20E-09	4.75E-09	NA	NA	NA
						Total risk, this exposure point:		9.61E-09	1.13E-07
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	8.96E-02	4.22E-01	NA	NA	NA
				Trichloroethene	5.16E-04	1.95E-03	1.10E-02	5.67E-06	2.14E-05
				Copper	1.71E-04	6.56E-04	NA	NA	NA
				Zinc	9.12E-05	3.83E-03	NA	NA	NA
			Dermal contact Bathing	Manganese	1.79E-04	8.43E-04	NA	NA	NA
				Trichloroethene	1.03E-06	3.89E-06	1.10E-02	1.13E-08	4.28E-08
				Copper	3.42E-07	1.71E-06	NA	NA	NA
				Zinc	1.82E-07	7.23E-06	NA	NA	NA
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	4.10E-03	1.55E-02	1.30E-02	5.33E-05	2.01E-04
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
					Total risk, residential use of ground water:			5.90E-05	2.23E-04
Surface water	Ground water (&/or Sediment leaching)	Little Schuylkill R. Hunters and Fishermen	Dermal contact	Manganese	3.47E-08	1.01E-06	NA	NA	NA
				Copper	5.41E-08	1.38E-07	NA	NA	NA
				Zinc	6.04E-07	1.34E-06	NA	NA	NA
			Incidental Ingestion	Manganese	1.05E-04	3.05E-04	NA	NA	NA
				Copper	1.75E-06	4.16E-06	NA	NA	NA
				Zinc	1.82E-05	4.04E-05	NA	NA	NA
						Total risk, this exposure point:		No contribution	No contribution

AR300296

Table 10 continued
EDM Site Endangerment Assessment
Calculation of Carcinogenic Risk
(Adult Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Carcinogenic Potency Factor (CPF)	Most Probable Carcinogenic Risk	Maximum Carcinogenic Risk
Surface water continued...	Ground water (&/or Sediment leaching)	Little Schuylkill R. Off-site residents, hunters and fishermen	Bioaccumulation (Fish ingestion)	Manganese	6.67E-03	2.56E-02	NA	NA	NA
				Copper	2.87E-04	7.08E-04	NA	NA	NA
				Zinc	7.28E-04	1.61E-03	NA	NA	NA
						Total risk, this exposure point:		No contribution	No contribution
Soil	Fluff	On-site Maintenance Workers	Dermal Contact	PCBs	1.12E-04	3.22E-03	7.70E+00	8.61E-04	2.48E-02
				Dioxin	1.07E-08	1.07E-08	1.56E+05	1.67E-03	1.67E-03
				Zinc	1.16E-03	1.31E-03	NA	NA	NA
			Incidental Ingestion	PCBs	1.76E-05	1.02E-03	7.70E+00	1.36E-04	7.83E-03
				Dioxin	1.66E-09	3.38E-09	1.56E+05	2.84E-04	5.28E-04
				Zinc	6.10E-04	1.38E-03	NA	NA	NA
						Total risk, this exposure point		3.08E-03	3.46E-02
	Surface soil	On-site Maintenance Workers	Dermal contact	Manganese	7.48E-06	1.83E-04	NA	NA	NA
				PCBs	7.66E-06	4.89E-05	7.70E+00	5.90E-05	3.77E-04
				Dioxin	7.28E-10	1.46E-09	1.56E+05	1.14E-04	2.27E-04
				Copper	2.45E-06	2.30E-02	NA	NA	NA
				Zinc	7.66E-06	2.51E-04	NA	NA	NA
				DEHP	2.99E-04	6.73E-04	1.40E-02	4.19E-06	9.42E-06
			Incidental ingestion	Manganese	1.12E-04	5.47E-04	NA	NA	NA
				PCBs	3.44E-06	1.46E-04	7.70E+00	2.65E-05	1.13E-03
				Dioxin	3.26E-10	4.35E-09	1.56E+05	5.08E-05	6.79E-04
				Copper	3.66E-03	6.58E-02	NA	NA	NA
				Zinc	1.15E-04	7.50E-04	NA	NA	NA
				DEHP	4.47E-04	2.01E-03	1.40E-02	6.26E-06	2.82E-05
						Total risk, this exposure point:		3.00E-04	2.46E-03
						Total carcinogenic risk to on-site maintenance workers:		3.10E-03	3.73E-02
						Total carcinogenic risk to off-site residents (includes hunting and fishing scenario):		0.00E+00	2.40E-04
						Total carcinogenic risk to off-site workers:		5.36E-07	3.86E-06
						Total carcinogenic risk to hunters and fishermen:		0.00E+00	1.13E-07

NA - Not applicable

Note. 100 mg/day was used in calculating ingestion of Surface soil and Fluff for maximum exposure; only the worst of the two was used in the total maximum risk calculation.

AR300297

Table 11
EDM Site Endangerment Assessment
Calculation of Carcinogenic Risk
(Child 6-12 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Carcinogenic Potency Factor (CPF)	Most Probable Carcinogenic Risk	Maximum Carcinogenic Risk
Air	Fluff	On-site	Inhalation	PCBs	1.08E-09	3.09E-08	7.70E+00	8.29E-09	2.38E-07
				Dioxin	1.00E-13	1.00E-13	1.56E+05	1.56E-08	1.56E-08
				Zinc	1.11E-08	1.25E-08	NA	NA	NA
					Total risk, this exposure point:			2.38E-08	2.54E-07
		Off-site residents	Inhalation	PCBs	1.01E-07	2.91E-06	7.70E+00	7.76E-07	2.24E-05
				Dioxin	7.91E-12	7.91E-12	1.56E+05	1.23E-06	1.23E-06
				Zinc	8.79E-07	9.94E-07	NA	NA	NA
					Total risk, this exposure point:			2.01E-06	2.37E-05
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	2.17E-01	1.02E+00	NA	NA	NA
				Trichloroethene	1.25E-03	4.73E-03	1.10E-02	1.38E-05	5.21E-05
				Copper	4.18E-04	2.08E-03	NA	NA	NA
				Zinc	2.23E-03	8.79E-03	NA	NA	NA
			Dermal contact (Bathing)	Manganese	2.51E-04	1.18E-03	NA	NA	NA
				Trichloroethene	1.45E-06	5.46E-06	1.10E-02	1.59E-08	6.01E-08
				Copper	4.80E-07	2.40E-06	NA	NA	NA
				Zinc	2.56E-06	1.01E-05	NA	NA	NA
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	5.54E-03	2.09E-02	1.30E-02	7.21E-05	2.72E-04
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
					Total risk, residential use of ground water:			8.59E-05	3.24E-04
Sediment	Fluff (mixed with sediment)	Off-site (stream)	Dermal contact	Manganese	3.82E-05	1.56E-04	NA	NA	NA
				PCBs	1.25E-07	3.93E-07	7.70E+00	9.60E-07	3.03E-06
				Copper	2.70E-05	1.04E-04	NA	NA	NA
				Zinc	7.44E-06	1.41E-05	NA	NA	NA
				DEHP	1.06E-05	3.51E-05	1.40E-02	1.48E-07	4.91E-07
			Incidental ingestion	Manganese	2.01E-04	8.15E-04	NA	NA	NA
				PCBs	1.96E-07	2.06E-06	7.70E+00	1.51E-06	1.59E-05
				Copper	1.47E-04	5.45E-04	NA	NA	NA
				Zinc	3.01E-05	7.39E-05	NA	NA	NA
				DEHP	5.54E-05	1.84E-04	1.40E-02	7.76E-07	2.58E-06
					Total risk, this exposure point:			3.40E-06	2.20E-05
Surface water	Leachate	On-site	Dermal Contact	Manganese	1.28E-05	2.55E-05	NA	NA	NA
				PCBs	5.60E-09	1.23E-08	7.70E+00	4.31E-08	9.51E-08
				Trichloroethene	2.57E-08	9.05E-08	1.10E-02	2.83E-10	9.96E-10
				Copper	3.60E-06	1.31E-05	NA	NA	NA
				Zinc	8.54E-06	1.66E-05	NA	NA	NA
				DEHP	2.88E-07	2.88E-07	1.40E-02	4.03E-09	4.03E-09
					Total risk, this exposure point:			4.74E-08	1.00E-07

NA - Not Applicable

AR300298

Table 11 (continued)
EDM Site Endangerment Assessment
Calculation of Carcinogenic Risk
(Child 6-12 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Carcinogenic Potency Factor (CPF)	Most Probable Carcinogenic Risk	Maximum Carcinogenic Risk
Surface Water continued...	Ground water (&/or Sediment leaching)	Intermittent stream	Dermal contact	Manganese	1.96E-06	5.72E-06	NA	NA	NA
				Copper	3.29E-08	7.82E-08	NA	NA	NA
				Zinc	3.42E-07	7.59E-07	NA	NA	NA
			Incidental ingestion	Manganese	1.96E-06	5.72E-06	NA	NA	NA
				Copper	1.97E-06	4.67E-06	NA	NA	NA
				Zinc	2.04E-06	4.53E-06	NA	NA	NA
						Total risk, this exposure point:		No contribution	No contribution
		Little Schuylkill R.	Dermal contact	Manganese	1.96E-06	5.72E-06	NA	NA	NA
				Copper	3.29E-08	7.82E-08	NA	NA	NA
				Zinc	3.42E-07	7.59E-07	NA	NA	NA
			Incidental ingestion	Manganese	1.96E-06	5.72E-06	NA	NA	NA
				Copper	1.97E-06	4.67E-06	NA	NA	NA
				Zinc	2.04E-06	4.53E-06	NA	NA	NA
			Bioaccumulation (Fish ingestion)	Manganese	2.14E-02	6.23E-02	NA	NA	NA
				Copper	7.17E-04	1.70E-03	NA	NA	NA
				Zinc	1.76E-03	3.89E-03	NA	NA	NA
						Total risk, this exposure point:		No contribution	No contribution
Soil	Fluff	On-site	Dermal Contact	PCBs	2.57E-05	7.40E-04	7.70E+00	1.98E-04	5.70E-03
				Dioxin	2.46E-09	2.46E-09	1.56E+05	3.84E-04	3.84E-04
				Zinc	2.66E-04	3.01E-04	NA	NA	NA
			Incidental ingestion	PCBs	7.11E-06	2.05E-04	7.70E+00	5.48E-05	1.58E-03
				Dioxin	6.82E-10	6.82E-10	1.56E+05	1.06E-04	1.06E-04
				Zinc	2.48E-04	2.78E-04	NA	NA	NA
						Total risk, this exposure point:		7.43E-04	7.78E-03
	Surface soil	On site	Dermal contact	Manganese	1.72E-05	4.20E-05	NA	NA	NA
				PCBs	1.76E-06	1.12E-05	7.70E+00	1.35E-05	8.65E-05
				Dioxin	1.67E-10	3.34E-10	1.56E+05	2.61E-05	5.21E-05
				Copper	6.42E-07	5.06E-03	NA	NA	NA
				Zinc	1.76E-05	5.76E-05	NA	NA	NA
				DEHP	6.87E-05	1.54E-04	1.40E-02	9.61E-07	2.16E-06
			Incidental ingestion	Manganese	4.51E-05	2.21E-04	NA	NA	NA
				PCBs	1.39E-06	5.90E-05	7.70E+00	1.07E-05	4.54E-04
				Dioxin	1.32E-10	1.75E-09	1.56E+05	2.05E-05	2.74E-04
				Copper	1.47E-03	2.65E-02	NA	NA	NA
				Zinc	4.63E-05	3.02E-04	NA	NA	NA
				DEHP	1.80E-04	8.11E-04	1.40E-02	2.52E-06	1.13E-05
						Total risk, this exposure point:		7.43E-05	8.60E-04

Table 12
KDM Site Endangerment Assessment
Calculation of Carcinogenic Risk
(Child 2-6 Population)

Potential Transport Medium	Source	Potential Exposure Point	Potential Exposure Route	Indicator Compound	Calculated Most Probable Hypothetical Intake	Calculated Maximum Hypothetical Intake	Carcinogenic Potency Factor (CPF)	Most Probable Carcinogenic Risk	Maximum Carcinogenic Risk
Air	Fluff	Off-site residents	Inhalation	PCBs	9.93E-08	2.87E-06	7.70E+00	7.64E-07	2.21E-05
				Dioxin	7.79E-12	7.79E-12	1.56E+05	1.22E-06	1.22E-06
				Zinc	8.66E-07	8.79E-07	NA	NA	NA
					Total risk, this exposure point:			1.98E-06	2.33E-05
Ground Water	Fluff Pile	Hypothetical downgradient well	Ingestion	Manganese	3.93E-01	1.86E+00	NA	NA	NA
				Trichloroethene	2.27E-03	8.55E-03	1.10E-02	2.49E-05	9.41E-05
				Copper	7.52E-04	3.76E-03	NA	NA	NA
				Zinc	4.00E-03	1.60E-02	NA	NA	NA
			Dermal contact (Bathing)	Manganese	3.01E-04	1.42E-03	NA	NA	NA
				Trichloroethene	1.74E-06	6.55E-06	1.10E-02	1.91E-08	7.21E-08
				Copper	5.76E-07	2.88E-06	NA	NA	NA
				Zinc	3.07E-06	1.23E-05	NA	NA	NA
			Inhalation While Bathing (Volatile compounds only)	Manganese	---	---	NA	NA	NA
				Trichloroethene	5.30E-03	2.00E-02	1.30E-02	6.89E-05	2.60E-04
				Copper	---	---	NA	NA	NA
				Zinc	---	---	NA	NA	NA
					Total risk, residential use of ground water:			9.38E-05	3.54E-04
Surface Water	Ground Water (&/or Sediment leaching)	Little Schuylkill R.	Bioaccumulation (Fish ingestion)	Manganese	3.86E-02	1.13E-01	NA	NA	NA
				Copper	1.30E-03	3.09E-03	NA	NA	NA
				Zinc	5.10E-03	7.05E-03	NA	NA	NA
					Total risk, this exposure point:			No contribution	No contribution
					Total risk, all exposures:			9.58E-05	3.78E-04

NA - Not Applicable

Table 13
EDM Site Endangerment Assessment
Calculation of Theoretical Total Lifetime Carcinogenic Risk

	Contribution to Most Probable Lifetime Risk	Contribution to Maximum Lifetime Risk
Adults, off-site residents	5.16E-05	2.05E-04
Children, age 6-12	8.01E-05	7.17E-04
Children, age 2-6	5.64E-06	2.22E-05
THEORETICAL TOTAL MOST PROBABLE LIFETIME CANCER RISK:	**1.37E-04**	
THEORETICAL TOTAL MAXIMUM LIFETIME CANCER RISK:		**9.44E-04**

Note:
The hypothetical exposure assumptions included in these calculations are listed below.

All ages: off-site fugitive dust at residence (predicted by air model) residential use of hypothetical downgradient well water

Adults: additional off-site fugitive dust exposure as hunters and fishermen

Children 6-12: off-site recreational exposure to intermittent stream sediment on-site recreational exposure to surface soil, fluff, and leachate (fence-down scenario)

Other Populations	Most Probable Lifetime Risk	Maximum Lifetime Risk
Total carcinogenic risk. on-site maintenance workers (30 yrs. exposure)	1.4E-03	1.6E-02
Total carcinogenic risk. off-site workers (30 yrs. exposure)	1.5E-07	1.6E-06
Total carcinogenic risk. hunters and fishermen (58 yrs. exposure)	8.2E-09	9.6E-08

except one small emergent wetland, are located offsite. No rare or endangered species have been reported or observed on or near the Site. Although an intensive ecological risk assessment was not conducted, some indication of potential risk to wildlife and the environment can be assessed from the toxicity testing (bioassays), field assessment, and human health risk analysis and Site conditions.

The lack of suitable habitat on or near the Site and the Site fence discourages wildlife utilization of the Site. Large mammals are prevented from easily entering by the Site fence. Small animals, birds, and soil invertebrates are limited by lack of habitat.

The intermittent stream currently supports little aquatic life, most likely due to elevated contaminant levels. Direct discharge of contaminated overburden ground water and contaminated seeps into the intermittent stream have resulted in contaminated sediments and surface water in the stream. Federal and state surface water standards are exceeded for copper, lead, zinc, manganese, and iron in this stream. The results of the intermittent stream bioassays indicate possible Site-related toxicity to aquatic life in the intermittent stream due to metals.

The Little Schuylkill River does not support resident aquatic life for approximately 5 miles downstream due to its acid mine degraded condition. Transport of sediment does not seem to have a significant effect on metals concentrations because sediment samples collected from the Little Schuylkill River both upstream and downstream of the tributary did not significantly differ for metals.

D. Significant Sources of Uncertainty

Discussion of general limitations inherent in the risk assessment process as well as the uncertainty related to some of the major assumptions made in this assessment are included below.

1. The Risk Assessment is based upon the data collected during the RI and uses RI sampling results and predictive modeling to represent environmental concentrations over large areas. This extrapolation contributes to the uncertainty of the Risk Assessment. Also, air and emissions modeling is used rather than actual sampling to predict the exposure concentrations due to fugitive dust emissions from the Site.

2. The potential human exposure to ground water is probably not very substantial. No existing ground water users are present in areas hydraulically downgradient of the Site. Also, no downstream use of the Little Schuylkill River water (which is the discharge point for ground water from the Site) for residential water supplies has been identified in the vicinity of the Site at this time. However, aquatic life is exposed to contaminated ground water via direct discharge and seepage to the intermittent stream.

3. The onsite exposures for children ages 6-12 are based on the assumptions that the fence around the Site is not in place and that no remediation has occurred.

4. Lead, phthalates, and PCBs may be chemically bound in the plastic matrix of the fluff and, therefore, fluff (and soil) may not be as bioavailable as assumed in the risk assessment.

5. Due to the limitations of the risk assessment process itself and to conservative assumptions made specific to the EDM Site, the risk levels calculated are considered to be estimates of worst-case risk.

6. The CPSs and reference doses contain uncertainties resulting from extrapolating from high to low doses and from animals to humans. Protective assumptions were made to cover these uncertainties.

E. Risk Assessment Conclusions

1. Exposure of adult onsite maintenance workers to copper in the surface soil and exposure to a hypothetical downgradient well (on the Site or state game lands) for all age groups were significant (hazard index greater than one) noncarcinogenic hazards for individual pathways and populations at the Site. Actual exposures for children age 2-6 also presented a significant noncarcinogenic risk.

2. Exposure to the fluff and onsite surface soil by onsite maintenance workers, and (for fluff only) children age 6-12 trespassing on the EDM site presented significant carcinogenic risks greater than 1 x 10-4. The potential risks associated with these exposures are related to PCBs and dioxin in fluff material and Site soils.

3. Residential use of ground water from a hypothetical well location downgradient of the Site exceeded 1 x 10-4 for maximum estimates of carcinogenic risk. The risk is driven by the presence of trichloroethylene in ground water.

4. The estimated “most probable” lifetime carcinogenic risk for offsite residents is above the potentially acceptable range. Under the “maximum” lifetime carcinogenic risk scenario, the risk to offsite residents also exceeds 1 x 10-4.

5. The intermittent stream currently supports little aquatic life, most likely due to elevated contaminant levels. Direct discharge of contaminated overburden ground water and contaminated seeps into the intermittent stream have resulted in contaminated sediments and surface water in the stream. The results of the intermittent stream bioassays indicate possible Site-related toxicity to aquatic life in the intermittent stream due to metals. Federal and state surface water standards are exceeded for copper, lead, zinc, manganese, and iron. Due to acid mine degradation in the Little Schuylkill River, it is extremely difficult to measure Site impacts on that river.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

VIII. DESCRIPTION OF ALTERNATIVES

In accordance with Section 300.430 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. §300.430, a list of remedial response actions and representative technologies were identified and screened to meet the remedial action objectives at the Site. The technologies that passed the screening were assembled to form remedial alternatives. The Feasibility Study (FS) evaluated a variety of technologies used in the development of alternatives for addressing the fluff. Upon further analysis, the technologies and approaches contained in the following alternatives were determined to be the most applicable for OU3 of this Site.

<u>Remedial Action Alternative 1</u> – NO ACTION

The NCP requires that EPA consider a "No Action" alternative for every site to establish a baseline for comparison to alternatives that do require action. Under this alternative, no action would be taken to remove, remediate, contain, or otherwise address contamination at the EDM Site.

Because this alternative would neither eliminate nor reduce to acceptable levels the threats to human health or the environment presented by contamination at OU3, this alternative serves only as a baseline for comparison to other alternatives.

Capital Cost:	$ 0
<u>Annual O&M, Present Worth:</u>	<u>$ 0</u>
TOTAL COST	$ 0

<u>Remedial Action Alternative 2</u> – ONSITE RECYCLING OF FLUFF; DISPOSAL OF NON-RECYCLABLES AND RECYCLING RESIDUALS; SOIL SAMPLING

A. <u>Description</u>

Under this alternative, all recyclable fluff (waste insulation material consisting primarily of polyvinyl chloride and polyethylene chips; fibrous material; and paper, soil, and metal on the surface of the Site other than that to be remediated pursuant

Appendix IV

Table 4-1

Alternative 6 Design Criteria Summary
Eastern Diversified Metals Site
Hometown, PA

Design Criteria	Means to Address
A. Remedy Performance Requirements	
1. In-Place Closure Performance Standards	
• The In-Place Closure alternative would be designed and constructed to protect human health and the environment, by:	
- Preventing direct exposure to contaminated materials,	Multilayer cap construction
- Preventing material migration via surface water and wind erosion,	Multilayer cap construction with surface water runoff management and erosion controls.
- Restricting the infiltration of surface water and subsequent leachate generation.	Multilayer cap construction with permeability less than or equal to 1 x 10^{-7}cm/sec.
• The cap would be designed to function with:	
- Minimal maintenance	Selection and monitoring of appropriate vegetative cover.
- Minimize air and water erosion of material	Selection and monitoring of appropriate vegetative cover. Design of diversion and drainage channels and erosion and sediment control features.
- Accommodate settling	Designed to inhibit differential settlement and with slopes that can accommodate settlement.
- Provide adequate freeze protection	Cap design would incorporate a minimum 2-foot soil cover.
• Sufficiently cover the existing (regraded) fluff pile to minimize water infiltration through the waste.	The cap would be designed to sufficiently overlap all material requiring in-place

Table 4-1

Alternative 6 Design Criteria Summary
Eastern Diversified Metals Site
Hometown, PA

Design Criteria	Means to Address
	closure.
• Remaining mounds of mixed soil and wire located outside the site fence will be consolidated with the fluff pile and capped, along with any visual fluff and lead-impacted soils (soils with > 1,000 ppm, lead).	Design activities will focus on cap regrading, material consolidation and anticipated cap footprint delineation.
• Relevant provisions from the Pennsylvania Residual and Hazardous Waste regulations would be incorporated into the in-place closure design, as appropriate, including:	
- Access control	Fencing (with a locked gate) would be maintained to prevent unauthorized access.
- Final cover and grading	Final cover would consist of (in order from bottom to top): soil subgrade, geosynthetic clay liner, HDPE flexible membrane liner, synthetic drainage layer, soil cover, topsoil and vegetative cover. Surfaces would be graded to promote drainage of the cap surface.
- Revegetation	Cap vegetation would be selected to establish dense, sustainable vegetative cover.
- Standards for successful revegetation	Performance standards would be established to insure that permanent ground cover is established.
- Soil erosion and sedimentation control	Temporary and permanent soil erosion and sediment control features (e.g., silt fence, sediment control

Table 4-1

Alternative 6 Design Criteria Summary
Eastern Diversified Metals Site
Hometown, PA

Design Criteria	Means to Address
	basins, etc.) would be designed, installed and maintained in accordance with State requirements.
- Post closure land use	Measures would be taken incorporate post closure land use into site monitoring and maintenance activities. Standard monitoring and maintenance activities would be outlined in the Operations and Maintenance Plan. Institutional controls would be implemented to prevent disturbance of the multilayer cap.
2. Long-Term Monitoring and Site Inspections Performance Standards	
• Operation of the existing site treatment plant (STP) will be continued for treatment of collected leachate (or operation of a pump station for treatment at the municipal treatment plant).	Would be addressed in the Operation and Maintenance Plan.
• Monitoring of ground water for site specific contaminants will be performed following cap construction.	same as above
• The cap and site fence will be inspected and maintained as needed, and site inspections will be conducted. Repairs will be made on as needed basis.	same as above
3. Institutional Controls	
• Institutional controls may be implemented to prevent land use that is	To be evaluated.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Eastern Diversified Metals Site
Record of Decision for OU4

DATE:

FROM: Abraham Ferdas, Director
Hazardous Site Cleanup Program

TO: Thomas C. Voltaggio, Acting Regional Administrator
EPA Region III

Attached is the Record of Decision (ROD) for the Eastern Diversified Metals Superfund Site in Rush Township, Pennsylvania. Several minor changes were made to the ROD since the Proposed Plan was issued. EPA decreased the numerical values of the soil clean up levels for dioxin, phthalates and lead in response to concerns expressed during the comment period from the public and the natural resource trustees. Because contaminants have not migrated deeply, EPA expects only a very minor change in the cost of the remedial action as the result of these reduced cleanup levels. Although the need to test for gas generation and determine the need for landfill gas controls is a normal part of landfill design, the ROD explicitly states this need, in response to concerns by the public.

The Wilkes-Barre office of the PADEP concurred with the selected remedy and their concurrence letter is attached.

I recommend that you sign the attached document.

CONCURRENCES

SYMBOL	3HS22	3HS22	3RC22	3RC22	3HS20			
SURNAME	F. VAVRA	W. GRAHAM	T. CINTI	J. DONOVAN	P. SCHAUL			
DATE								

EPA Form 1320-1 (12-70) OFFICIAL FILE COPY

Celebrating 25 Years of Environmental Progress

Signature

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Eastern Diversified Metals Site
Record of Decision for OU4

DATE:

FROM: Abraham Ferdas, Director
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TO: Thomas C. Voltaggio, Acting Regional Administrator
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I recommend that you sign the attached document.

CAF 11/26/01

CONCURRENCES

YMBOL	3HS22	3HS22	3RC21	3RC21	3HS20	3HS00	3RC40	
JRNAME	F. Vavra FV	G. Crystall	B. Cohan	H. Torres	P. Schaul	A. Ferdas	WR	
ATE	8/13/01	8/13/01	8/14/01	8-30-01		9/24/01	8-30-01	

PA Form 1320-1 (12-70) OFFICIAL FILE COPY

Celebrating 25 Years of Environmental Progress

Eastern Diversified Metals Site
Part III - Responsiveness Summary - Operable Unit 4 ROD
Substantive Comments, Questions or Concerns
August 2001

Purpose: This Responsiveness Summary consolidates and responds to the substantive questions, comments and concerns that were expressed during the public comment period for the Operable Unit 4 ROD. After the comment period closed, EPA reviewed the public meeting transcript, the letters and E-mails received during the comment period, researched the issues and produced this Responsiveness Summary. The Responsiveness Summary is organized as follows:

- Overview

- General Public - Summary of citizens feedback received during the public comment period and EPA's responses. This includes comments received at the public meeting and mail from residents, elected officials and environmental organizations.

- The Pennsylvania Department of Environmental Protection (PADEP)- This section contains questions and comments from the PADEP, which is the support agency for this site. EPA's responses to the PADEP's comments on the published Proposed Plan are also included.

- Comments from Lucent Technologies - Lucent Technologies is the Potentially Responsible Party who has performed most of the cleanup work at the Superfund Site. If other PRPs had responded, the section would have been titled Comments from Potentially Responsible Parties.

Overview

EPA has received numerous comments from both residents and elected officials - both in writing and during the public meeting - that expressed opposition to the capping alternative.

The public notice of the availability of the Proposed Plan and supporting documents was published in the Pottsville Republican and the Times News on October 18, 2000. These documents are in the Administrative Record file and the information repository maintained at the EPA Docket Room in Region 3 and at the office of the Rush Township Board of Supervisors. EPA provided a public comment period from October 18, 2000 to November 16, 2000. An extension to the public comment period was requested and granted, prolonging the public comment period to December 16, 2000.

At the public meeting, EPA answered questions about problems at the Site and the remedial alternatives. EPA also used this meeting to solicit a wider cross-section of community input on the reasonably anticipated future land use and potential ground water uses at the site. EPA's response to the comments received during this period is included in this Responsiveness Summary, which is part of this Record of Decision.

The public meeting was attended by approximately 200 people. Opposition to the capping proposal was vigorous and those who chose to speak were unanimously against capping the fluff pile. Congressman Tim Holden attended the meeting with his aide, Bill Hanley. Congressman Holden read a prepared statement, thus logging his opposition to the cap alternative into the public record. State Representative Argall sent an aide who also read a prepared statement opposing the cap alternative.

Congressman Holden sent a letter to EPA Regional Administrator Brad Campbell, again expressing opposition to the cap. Congressman Holden also submitted a letter to EPA Administrator Carol Browner, asking for a meeting to discuss the proposed cap alternative. Ms. Browner was unable to meet with him, so Congressman Holden met with Tim Fields (EPA

Administrator of OSWER) and Brad Campbell at EPA Headquarters. Congressman Holden asked EPA to verify the relative costs of treatment and offsite disposal versus capping. Subsequently, Congressman Holden asked again for a meeting with Carol Browner, but a change in administration prevented this meeting. EPA suggested a followup meeting after the cost review was completed. State Senator James Rhoades also submitted a letter to EPA during the comment period opposing the cap alternative.

Approximately fourteen hundred signatures were submitted on a petition opposing the capping alternative. This petition states: “We the undersigned request that the EPA removes the entire Diversified Metals fluff pile. We also want the entire site remediated and cleaned up as soon as possible. We do not want the fluff pile capped.” Additionally, eighteen letters from individuals were received in opposition to the capping alternative during the comment period.

Rush Township, Kline Township and Tamaqua Borough all submitted letters opposing the cap alternative, as did Schuylkill County. The following environmental organizations also expressed opposition to the cap alternative: 1) Little Schuylkill Conservation Club; 2) Schuylkill Headwaters Association; 3) Rush Township Environmental Commission; and 4) Schuylkill Conservation District.

The Pennsylvania Department of Environmental Protection submitted comments which did not object to the capping alternative proposed by EPA, but did submit some comments and concerns which are included below with EPA’s responses.

Lucent Technologies sent a letter during the comment period supporting the cap alternative.

General Public - This section consolidates comments from both the public meeting and the letters received during the comment period.

<u>Cap Concerns</u>

1) Comment: Virtually all public comments were opposed to capping and supported treatment/offsite disposal. Several meeting participants asked why EPA wouldn’t treat and send the waste to a permitted landfill which would have a double liner on the bottom of the landfill, a leachate collection system on the bottom of the landfill, and a cap similar to that proposed for the EDM Site. A comment was made that the RCRA cap is a lower standard of protectiveness than the requirements for new non-hazardous landfills, which require a cap and a bottom liner. Numerous participants felt that an offsite landfill was a much more secure long term solution.

Response: A full and very detailed rationale for EPA’s decision to select a cap is given in the preceding ROD, especially in the section titled: “Selected Remedy” on page 43. The following supplemental information gives additional information regarding why EPA did not believe the additional bottom liner was needed to produce a protective remedy. 1) The purpose of a bottom liner is to collect leachate for treatment and to prevent leachate from contaminating the surface water and ground water. 2) EDM stopped operations in the late 1970's, and even after ten years of constant exposure of the 250,000 cubic yard fluff pile to the rain, leaching was so minor that the ground water aquifer (bedrock) did not contain site contaminants above health based levels. In 1992, EPA issued a No Action ROD for the bedrock aquifer. After years of exposure to the elements, the pile did generate leachate which was captured by a collection and treatment system. This leachate is in the unconsolidated zone from the surface to about ten feet in depth. Although the leachate did contain contaminants, the concentrations were not very high and the PADEP’s NPDES permit only required reduction in organics such as phenols and removal of zinc. Lead, the primary contaminant of concern at the site, is only present at a level of about 20-100 ppb in leachate. The average lead level in leachate is about three times EPA’s action level for drinking water (15 ppb). Recent data taken by the PADEP confirms that lead levels have not increased in leachate and that the Little Schuylkill River is not significantly impacted by the EDM Site. In summary, although this site is a very substantial hazard to anyone coming in contact with the waste, <u>even if EPA took no further action at all</u> on the fluff pile, the impacts on ground water and surface water are minor.

Placing all of the waste under a double lined RCRA cap, and routing all surface water around the capped area will reduce the current minor impact on ground water and surface water to a negligible level. The bottom liner for solid waste landfills is generally only required for new landfills and most old closed landfills have been capped by both Superfund actions and state actions. The addition of a bottom liner is not needed or justified at the EDM Site.

2) Comment: Many comments expressed the opinion that cost should not be a major factor in EPA's decision, and the belief that EPA was giving cost far too much importance. Several people noted that EPA does not seem to consider cost very highly when commercial construction is blocked because of wetlands or endangered species protection. Several comments noted large sums of money spent by the government on other projects and suggested that Lucent was a large corporation fully capable of bearing the expense of treatment and offsite disposal.

Response: Cost is not the most important factor in remedy selection; Protectiveness is the most important factor. EPA's guidance directs project managers to screen out remedies which are not protective and which do not comply with existing environmental laws. However, once a group of remedies is identified which comply with these two most important factors, cost is a part of the selection process along with the other six EPA selection criteria. Treatment and offsite disposal are almost twice as expensive as onsite containment, and could be much more if nearby landfills could not obtain permit modifications to accept the waste. EPA also seeks some regional and national consistency in its remedy selection process, and most similar sites have had caps installed as the most appropriate remedy.

Although Lucent is a large corporation, this is irrelevant to EPA's public health decision making. It has taken over a decade for EPA to develop existing Superfund regulations which were subject to comment and criticism from the various stakeholders, including the public, industry, and environmental organizations. EPA seeks to implement these regulations in a fair, impartial, and consistent manner.

3) Comment: One citizen compared the cap to an upside down bowl and stated that water would flow downward out of the "bowl" and the cap would not protect the public against contaminants in the waste.

Response: If the upside down "bowl" were filled with wet paper, and if a trench surrounded the bowl so that water could not run under the bowl, initially some of the water in the paper would drain out. After a time, water would stop draining from the paper in the bowl and the paper would dry out. If the bowl were placed in the rain, the water would run off the surface of the bowl and into the surrounding trench. If a few drops of water got under the edge of the bowl, it might be adsorbed up into the paper, but would not leach downward and would again dry out. This is the concept of a cap in its simplest terms. In actuality, it is a very complex civil engineering project that usually experiences some problems which can be overcome in a proper design.

4) Comment: Several commentors asked whether capping was a reliable long term remedy. Two individuals noted that the cap will be next to a state gamelands. They questioned whether bullets could pierce the cap and whether this would degrade the protectiveness of the cap.

Response: EPA's experience is that capping is a reliable long- term remedy, if the cap is installed and maintained properly. As explained in some of the earlier responses, capping has been used extensively as a remedial action for closed landfills. EPA has actually issued guidance which selects a cap as the "presumptive remedy" for closed municipal landfills. This means that for closed municipal landfills, EPA's starting point is to presume that a cap is the correct alternative, and only select something different if there are compelling and unusual circumstances.

Bullets would not degrade the effectiveness of the cap. The liners will be covered by two feet of soil which would generally protect the underlying cap. However, even if some bullets made a tiny hole in the cap, the overall effect of a hole that is less than one square inch on a cap liner extending over several acres is negligible. As explained previously, the bedrock aquifer was not degraded by site contaminants <u>even when the pile was totally exposed to the elements</u>. Even if one hundred bullet holes were present in the cap, the cap would still reduce water infiltration by greater than 99%.

5) Comment: One commentor asked if the EDM waste is not safe for recycled products, why is it safe to contain it under the cap?

Response: To become sick from a chemical, an individual must be exposed to the chemical. If the EDM waste was recycled into products, exposure to the PCBs in the plastic would become possible during product usage. If the waste is contained under the cap, the PCBs and lead will still be toxic, but as long as the cap is maintained, the possibility of contact with the waste is eliminated. Levels in leachate and surface water are too low to pose a significant risk to public health.

6) Comment: Several residents expressed a belief that it will be impossible to keep surface water or springs from contacting the waste at the bottom of the capped containment. Prior to the creation of the fluff pile streams ran across the site and there are also several surface water drainage pathways that could introduce water into the bottom of the pile. One resident pointed out that if this happens water could be drawn up by capillary action into the waste pile, and leaching would continue.

Response: Isolation of the waste from surface water run-on and from possible springs will be an important element of the cap design. Lucent’s analysis which was reviewed by the U.S. Army Corps of Engineers indicated that this problem can be managed. Comments were made that there are some surface water culverts which may pose a treat to the cap by introducing runon into the fluff pile. During the remedial design, these will need to be located and the water carried by them rerouted around the pile. EPA believes that these problems can be overcome by a proper design.

7) Comment: One person suggested that capping is as outmoded as dumping raw sewage in streams. They stated that all caps will fail, requiring future generations to select new and more permanent remedies.

Response: Landfills are still the most common way to dispose of solid and hazardous wastes across the United States. The suggestion that the modem landfill is an antiquated technology is inaccurate. At the time that raw sewage was dumped into rivers, open dumps were the common way of disposing of both solid and hazardous waste. Trenches or pits were dug, the waste disposed into the pit and soil covered the waste. This technique was used at the Lipari Landfill, the number one site on EPA’s Superfund list. At the time of disposal, the site was inspected by the state, which commended the landfill on its operations.

Landfill design has evolved over the past several decades and when constructed properly is a safe method of waste containment. Most closed landfills of older design have had cap systems installed over the landfill without the requirement for a bottom liner. Most of the contaminants at the EDM Site are embedded in the plastic and don’t leach more than treated wastes do. At the EDM Site, EPA has required the installation of the most protective of caps, a double lined cap similar to caps used at RCRA hazardous waste landfills.

EPA understands the concerns expressed by the public about landfills in general, but there are no magic solutions to the large volumes of solid and hazardous water generated by our industrial society. Congress intended CERCLA and RCRA to minimize waste, but also required EPA to select cost effect remedial actions. EPA developed the concept of treating principal threat wastes (highly toxic or highly concentrated wastes) and containing wastes with low levels of contamination. The most widely used and cost-effective technology which actually destroys waste and converts most of the waste components into harmless byproducts is incineration. However, public fears have resulted in widespread and acute resistance to the siting and operation of incinerators. Incineration is also very expensive.

Many technologies exist, but often they are narrowly targeted to treat specific classes of contaminants. Generally, some form of solidification or stabilization is used for lead wastes and does not reduce the volume of the waste and is not preferred for large volumes of waste with low levels of lead contamination which do need meet the principal threat criteria.

8) Comment: One commentor was concerned that flooding has occurred in the past and he believed that future floods would destroy the cap.

Response: The remedial design considers surface water runon from unusual storm events and will design the surface water controls to adequately address this concern.

9) Comment: Several residents were concerned that the cap would not prevent future contamination of ground water.

Response: As explained in some of the earlier responses, even with the pile exposed for over a decade, contamination was not found in the bedrock aquifer and contaminants are at relatively low levels in the shallow overburden leachate. Generally, when waste is first dumped at a Site, a ground water plume develops and grows for several years until it reaches a maximum size and concentration. As the waste ages, and most soluble waste constituents decrease in the waste, the ground water plume begins to decline as the source becomes less concentrated. The waste at the EDM Site has been exposed to the elements for more than 20 years. Additionally, the contaminant of most concern is lead which generally is not very mobile and usually does not pose a great threat to ground water. In general, EPA has only seen substantial lead movement in ground water where the ground water is very acidic (for example at battery cracking sites). The cap will isolate the waste from rainfall and runon/runoff, dramatically reducing leaching. Cap maintenance will be required which will ensure continued isolation of the waste for many years. Since the bedrock aquifer has not been contaminated after twenty years of waste exposure, EPA has concluded that it is only a remote possibility that the aquifer could become more contaminated with virtually all of the contamination isolated under the cap.

<u>Long Term Monitoring</u>

10) Comment: The public raised concerns about the long-term monitoring of the Site. Some people expressed concern about using Lucent Technologies to monitor the safety and reliability of its own work.

Response: Lucent will not be the only organization monitoring the long- term performance of the cap system. Both EPA and the PADEP are responsible for the continuing effectiveness of the cap system. When Superfund was enacted, Congress addressed the concerns about long term reliability by requiring five year reviews at Superfund Sites that leave wastes onsite. EPA and the U. S. Army Corps of Engineers are developing new guidance for five year reviews and several technical guidance documents have been issued regarding proper cap inspections during these reviews.

11) Comment: Other individuals questioned the accuracy of EPA’s cost estimate for operations and maintenance which uses a 30 year duration of O&M in its standard cost estimate. Some members of the public asked how long the cap must be maintained, and wondered why EPA doesn’t use a much longer duration of O&M if the cap must be maintained forever. One person asked that if a very long duration of O&M were used, wouldn’t it be cheaper to treat the waste and send it offsite.

Response: EPA’s standard policy is to evaluate the cost of maintenance for 30 years. However, this would also be true for any landfill that the waste might be sent to for disposal. Once the landfill closes, these same issues would apply to that landfill. As explained earlier, there are few practical alternatives to containment for hazardous and solid wastes with relatively low levels of contamination. Additionally, institutional controls will be implemented to prevent damage to the cap system.

12) Comment: One person asked what would happen if the cap did fail in the future, and wondered whether people could be poisoned via ground water contamination by the time EPA detected the problem.

Response: The wastes at the EDM Site have been totally exposed to the elements for 20 years and no one has been poisoned by ground water contamination <u>in the complete absence of a cap.</u>

As explained in the Record of Decision, the primary risk at the EDM Site is from contact with the waste, not from contaminated ground water. The RCRA cap will have a double liner and two feet of vegetated soil. The primary liner will be very thick, tough, and seamed polyethylene plastic. In the unlikely event that cap failure developed that would allow contact with the waste, it should develop slowly and early indications of problems would be obvious from visual inspections. Additionally, the site will be fenced and access restricted.

13) Comment: The public asked who would maintain responsibility for long term monitoring and maintenance if Lucent were to go bankrupt and EPA were dissolved.

Response: One resident expressed concern about the very long term cap monitoring responsibilities and asked what would happen if Lucent Technologies went bankrupt. EPA has installed cap systems at many Superfund Sites that do not have a viable responsible party to implement the remedial action. At these Sites, EPA hired contractors to install the cap and may use contractors for future monitoring using the CERCLA trust fund. EPA could do this at the EDM Site if necessary, or the PADEP might perform this function, in the unlikely event that EPA was dissolved. EPA entered into de minimis settlements with numerous PRPs at the site and over two million dollars are available which can be used for cleanup work at this Site.

<u>Public Health Concerns</u>

14) Comment: Several people expressed a belief that cancer rates and other illnesses are elevated in the area, and that the Agency for Toxic Substances and Disease Registry should perform a health assessment or, at a minimum, interview nearby residents.

Response: EPA contacted the ATSDR after the public meeting and explained the public’s concerns. The ATSDR has inspected the EDM Site and has met with several concerned citizens. The ATSDR is currently assessing what actions are appropriate to follow up on the public’s concerns.

15) Comment: Several people asked whether EPA had followed up to see if EDM’s workers had unusual health problems, and suggested that ATSDR should include this in their assessment.

Response: EPA explained these suggestions to the ATSDR, however, the ATSDR has explained to EPA that this may be very difficult. The ATSDR is currently assessing what actions are appropriate to follow up on the public’s concerns. Detailed questions should be addressed by Tom Stukas from the ATSDR at (215)814-3142.

16) Comment: Several residents expressed concerns about dust and wind dispersal of fluff from the site potentially producing potential health problems. One nearby resident expressed concerns about the health effect of exposure to the plastic odor that emanates from the fluff pile. One person stated that the fluff dispersal back in the early 1980' s was so bad that visible fluff could be seen accumulating on windowsills. One person asked whether EPA had ever tested Hometown houses and businesses for fluff-related contaminants and asserted that EPA should do so.

Response: EPA has noted the plastic onsite smell, especially in warm weather. The plastics, polyethylene and polyvinyl chloride are not volatile and should not produce an odor. The metals at the site and the PCBs are also not volatile. The most volatile compound of concern is bis(2-ethylhexyl) phthalate. EPA had previously conducted air monitoring at the site for the major compounds including lead, PCBs and bis (2-ethylhexyl) phthalate. The results showed that these compounds were below OSHA standards for compounds in the air and particles of dust. These samples are in the Administrative Record in a Report produced by LAW Engineering and Environmental Services dated September 21, 1994. To verify the safety of the public from air emissions prior to issuing the proposed plan, EPA asked the Region 3 air division to perform some simplified air modeling for bis (2-ethylhexyl) phthalate. The model used the known concentrations of this compound in the fluff and the extent of the pile to determine if the expected level in air would be safe. This modeling supported the earlier finding that there was not an unacceptable risk from air emissions at the Site. Any air emissions at a distance from the Site would be further diluted as the air from the site mixes with offsite air. The cap will be installed with a gas collection system and if monitoring of the landfill gas shows that air pollution controls are necessary to protect public health or to abate a nuisance smell, appropriate air pollution controls will be installed.

One resident stated that when EDM was operating, fluff dispersal was so widespread that it accumulated on windowsills. EPA has seen no evidence of widespread wind dispersal even on the perimeter of the Site. Concentrations of contaminants drop dramatically with the distance from the fluff pile. Trees on the north, south and west sides of the site act as a windbreak and the fluff pile is in a ravine below higher ground to the east. The east side of the site is uphill to buildings which also act as a wind barrier. There may have been some isolated incidents of fluff dispersal when the pile was new, but EPA does not believe that there has been widespread dispersal that would justify sampling residences and buildings in Hometown. The primary contaminants in the fluff are lead and phthalates. Both of these compounds can be found in lead paint used on homes, and vinyl siding. Lead can be elevated from leaded gas auto emissions, pesticides and other sources. Phthalates are ubiquitous and are found almost everywhere. Determination of the source would depend on actually seeing fluff in the soils samples. EPA does not believe this effort is justified. Additionally, the installation of the cap will prevent any additional particulate migration.

17) Comment: Several other people expressed ecological concerns about fluff dispersal by wind. Citizens were also concerned that animals in the state gamelands could ingest contaminants and then be eaten by hunters producing human exposure to Site contaminants.

Response: The Site is fenced, and while deer have occasionally visited the site, the contaminants are closely bound to the fluff and are not migrating significantly. Fluff dispersal into the gamelands would primarily be in the stream and if on the ground, would be shortly covered by leaves and vegetation. PCBs are the only compound which significantly bioaccumulates, and the PCBs are bound in the plastic and do not leach significantly when the synthetic leaching procedure (SPLP) test is used. The SPLP mimics the effect of acid rain on material that is in the open or covered, but is not inside a landfill. Capping the Site will eliminate contact with the pile and the soil cleanup will reduce contaminants in the surrounding soils.

18) Comment: Will EPA wait for ATSDR to complete a new report or Health Assessment? The remedy has been delayed so long, why not wait until ATSDR has completed its investigation so that EPA has all the facts before making a decision.

Response: EPA did not believe that it was necessary to delay the Record of Decision until ATSDR completed its consultation; however because of widespread public concerns, EPA decided to wait until the ATSDR completed its health consultation. The Health Consultation concluded that the ROD would be protective of public health as long as EPA implements the following recommendation:

EPA should implement deed restrictions to prevent residential development or other use by young children (e.g., playgrounds, child care facilities) on the uncapped area of the Site.

EPA added this institutional control to the ROD. The Health Consultation has been placed in the administrative record.

<u>Surface Water and Leachate Concerns</u>

19) Comment: Several individuals expressed concern about leachate seeps which drain into the Little Schuylkill River. They noted that the quality of the Little Schuylkill River upstream of the site has improved dramatically and that fish are returning to the river. They expressed concern that the leachate seeps are a threat to the health of the river.

Response: The PADEP sampled the Little Schuylkill River upstream and downstream of the EDM site in December 2000. The results of this sampling show that contaminants are not being elevated by the EDM Site and that the river quality above and below the Site is essentially the same.

20) Comment: Does EPA test for PCBs and Dioxins in the leachate? If not, how do we know these compounds are not present?

Response: EPA sampled a wide array of Site contaminants prior to the treatment plant upgrade. The current analysis is based on the PADEP's requirements in the now expired NPDES permit. This required sampling and analysis for a limited number of contaminants and parameters. The permit required routine (monthly) sampling/analysis for chemical and biological oxygen demand, total suspended solids, zinc and pH. Quarterly sampling added aluminum, copper, iron, lead, manganese and chloroform to the list of compounds for analysis.

In December 2000, the PADEP sampled leachate, shallow ground water, treatment plant influent, treatment plant effluent, the unnamed tributary and the Little Schuylkill River. PCBs were not detected in any of the samples, even in the leachate (detection level of 10 ppb). This is expected because PCBs are large molecules with low water solubility and which are adsorbed onto soils. Dioxins are also very large molecules with low water solubilities and high concentrations that were limited to one small area of the burn Site. Although PCBs were widespread through the site, they were not detected in the leachate. The dioxins were limited to one small burn area and should be adsorbed in the fluff and soils. Dioxin analysis is extremely expensive and EPA does not believe that it is necessary to analyze the leachate for dioxins.

21) Comment: Citizens expressed concerns regarding fluff entering the Schuylkill River both currently and over the past decade. The surface water ditches get some runoff water from the surface of the pile. This runoff carries fluff to the unnamed tributary and subsequently to the Little Schuylkill River. One person asked why we didn't intend to find and cleanup fluff which escaped into the Little Schuylkill River. Several commentors expressed a belief that the releases from the EDM Site threatened the entire area, including the Schuylkill, its tributaries, and communities downstream.

Response: EPA agrees that some fluff has entered the Little Schuylkill River via the unnamed tributary. EPA will remove contaminated sediments from the unnamed tributary, but will not investigate or try to remediate the small amounts of fluff that have carried into the Little Schuylkill River downstream from the Site. EPA considered the risk posed by very small amounts of widely dispersed fluff to be minor and limited the cleanup of sediments to the unnamed tributary. This is discussed further in the Record of Decision for Operable Unit 1 and 2 on page 21. The Record of Decision is contained in the Administrative Record at the Site repository. This Record of Decision states: "Transport of sediment does not seem to have a significant effect on the metals concentrations because sediment samples collected from the Little Schuylkill River both upstream and downstream of the tributary did not significantly differ for metals".

There are two different types of plastic in the fluff pile which can be separated by water, because polyvinyl chloride sinks and polyethylene plastic floats. Polyvinyl chloride contains most of the Site contaminants. The polyethylene which contained much lower levels of contaminants floats and this plastic would be the type most easily carried offsite by surface water a long distance. The polyethylene poses a negligible threat to the river ecology. Particles of polyethylene would tend to wash up on sand or mud bars, while any PVC which did enter the river would probably distribute to the sediments on the bottom of the river. Contaminant levels in the unnamed tributary are relatively low, and after dispersal in the Little Schuylkill River, would have little impact. The water quality of the Little Schuylkill River is generally the same upstream and downstream of the EDM site based on the PADEP's December 2000 sampling.

22) Comment: Concern was expressed that the current stormwater conveyences are not adequate and need to be improved.

Response: EPA agrees that the stormwater conveyances need to be improved and this will be addressed during the design of the cap system.

23) Comment: How will EPA remove the sediments from the unnamed tributary? What will happen to the sediment? When will this happen? Isn't it illegal to excavate the stream?

Response: After the cap remedial action is completed, EPA will excavate sediments in the unnamed tributary. Sediments will be excavated until no visible fluff is observed. This will be performed using a method that will minimize any destruction of the surrounding trees and wetlands plants. The excavated sediments will be disposed offsite in a municipal landfill. This action is not part of this Record of Decision, but was defined in the first Record of Decision issued on March 29, 1991. The action will be performed in compliance with the ARARs listed in that ROD.

Due to concerns about the effectiveness of dredging PCB contaminated sediments in large navigatable waters, a study was performed by the National Academy of Sciences. A moratorium is in place on the issuance of new decision documents requiring dredging of PCB contaminated sediments until June 30, 2001 or until EPA has properly considered the NAS report, whichever comes first. For actions which are planned to begin this year due to past RODs, EPA Regions are required to consult with EPA Headquarters. This sediment removal action is due to a past decision and will not be implemented for several years. EPA guidance and direction on sediment removals should be fully evolved by the time that this remedial action is implemented.

<u>Remedy Selection Considerations and Concern</u>

24) Comment: Many questions were asked about using of the adjacent rail line to either transport waste from the site or to bring materials into the Site. One resident asked whether EPA's analysis for off-site disposal showing twelve hundred truck trips through the town was a scare tactic to obtain public acceptance of the capping alternative. Several people seemed to believe that if rail were used instead of trucks, the cost of treatment and offsite disposal might be competitive with capping.

Response: EPA is certainly not using the estimate of truck traffic as a scare tactic. This is generally the transportation mode used for scoping cost estimates at Superfund Sites. Many Superfund Sites do not have access to rail and trucks are the most versatile and widely used method for transportation of materials at Superfund Sites. Even if rail is nearby, generally transfer stations or spurs must be constructed and then trucks used to make the local deliveries. This tends to offset the cost advantage for shipment by rail for short-term projects. Additionally, at some sites there has been public resistance to the construction of a transfer station handling CERCLA waste which has substantially delayed progress at those Sites. At the Marjol Battery Site in Region 3, a detailed comparison of shipping waste by rail versus truck showed that costs were about the same by the two methods. Rail shipment was cheaper per cubic yard, but this advantage was offset by the cost of construction of transfer stations.

Comments at the public meeting suggested that residents believed that transportation costs were the major cost of the selected remedy for offsite disposal. In fact, transportation costs are a relatively minor element in the total cost of the offsite treatment and disposal remedy. The cost of transportation used for the scoping estimate in the FFS was $10 per cubic yard of waste. The overall remedy cost was about $95 per cubic yard while the capping alternative is about $58 per cubic yard. Even if rail shipments of waste cost only half that of shipments by truck, the cost of treatment/offsite disposal would only be reduced to $90 per cubic yard. This is still far more than capping the site would cost. EPA believes that when the cost of adding a spur and a possible transfer station are added there would only be a very small cost savings, or none at all.

25) Comment: One resident contended that redevelopment of the EDM property would be much more attractive if the fluff pile was removed. Another person commented that they could not sell their land, once the potential buyer found out about the Site.

Response: EPA agrees that the redevelopment of the EDM property would be somewhat more attractive if the fluff pile were removed. However, most of the area occupied by the fluff pile is not level ground and slopes downward toward the river. It is much less suitable for development than the upper area that EPA is trying to provide for development.

26) Comment: Several residents raised environmental equity concerns about capping the Site. These residents stated that Hometown already had the Tonnoli Site, the McAdoo Site and several other environmental problems in the area. Since Hometown already has so many environmental problems, why doesn't EPA take the waste away?

Response: The use of the term environmental equity in this context is different from the way EPA usually views environmental equity. This term has generally been related to permitting new "dirty" industry in poor or minority areas that already have high risks due to other industrial sources. For example, in some urban areas, soil lead is high from years of traffic when lead was in gasoline, refineries and other industrial sources are emitting various carcinogens which may already cause risks to residents above EPA's acceptable levels. This term would generally be used in relation to a permitting decision to allow a new industry to be sited in the areas that would further increase the chemical burden on the residents already exposed to unhealthy levels of contaminants.

The Tonolli and McAdoo Sites have been remediated by EPA, reducing the risk to Hometown residents, and EPA is not permitting a new source of contamination into the Hometown area. EPA is in fact trying to further reduce the risk to Hometown residents by capping the EDM Site and preventing any future exposure to contaminants. EPA's nine decision criteria do not include the presence of other waste sites, or industrial sources of pollution. EPA has made its decision based on the nine criteria for remedy selection, environmental regulations and EPA policy.

27) Comment: One person suggested that EPA require Lucent to pay the cost of the cap and to have the Superfund trust fund cover the additional costs of treating the waste and sending it for offsite disposal.

Response: This is not a viable option under current law, regulations and policy. EPA determines the appropriate remedy for the Site regardless of who may conduct the cleanup and then negotiates a cleanup agreement or orders a site cleanup when a responsible party is available. If there are no viable responsible parties, EPA conducts the cleanup using the CERCLA trust fund (Superfund).

28) Comment: One person asked why EPA couldn't just incinerate all of the fluff?

Response: On-site incineration is both expensive and has generally been unpopular with the public due to concerns about dioxin emission. Additionally, PVC can be a precursor for dioxin production as evidenced by the fires in the fluff which produced dioxin. At another fluff site, pilot incinerator studies at the MW Site produced high enough levels of dioxin that EPA abandoned its plan to incinerate the fluff and selected another technology. If the waste were sent offsite, acceptance might be a problem because incinerators also have chlorine emission limits. The incinerator might only be able to process the waste very slowly to avoid exceeding its chlorine limits. Incineration is also very expensive and EPA would probably need to send the waste a very long distance to an incinerator outside of Pennsylvania.

29) Comment: Local landfills cannot accept PCBs without a permit modification. However, Congressman Holden stated his belief that if offsite disposal were selected the permit problems could be worked out.

Response: EPA is certain that Congressman Holden would have helped facilitate permit modification approval if EPA had selected offsite disposal. There were however many other factors for EPA to consider which led to selection of the on- site containment alternative.

30) Comment: One person noted that EPA, Lucent and elected officials were approached by a group that wanted to take all of the EDM waste away in railcars. Why didn’t EPA just accept their offer to take the waste offsite in railcars?

Response: EPA assumes that the resident was referring to a company, which frequently contacted Lucent Technologies, EPA and Congressman Holden during 1999. Unfortunately, this company revealed no details at all regarding its plans for the waste, asserting that their plan was proprietary. EPA received periodic letters and phone calls from this organization which was eager to solve the disposal problem at EDM, but would only reveal its plans if the EPA were willing to sign a secrecy agreement. EPA’s lawyers indicated that this was not appropriate. EPA tried to convey that the Superfund process cannot operate in a secret manner, and that EPA must submit a relatively detailed plan to the public for public comment. EPA did locate a web site which showed that one of the organization’s activities was construction of extremely low cost housing for the third world. EPA informed this organization in a letter that EPA did not know what their plans were for the EDM waste plastic, but construction of low cost housing with this waste plastic would be unacceptable. The plastic contains PCBs, lead and other chemicals, which unless properly processed and encapsulated by a material with long term resistance to the elements, could potentially harm children if they were directly exposed to this plastic. This organization stopped contacting EPA and EPA never learned what they actually planned to do with this material.

31) Comment: One resident asked about the cost of treatment and offsite disposal if copper was recovered. Early estimates indicated the presence of $ 8 million worth of copper in the pile which could be used to offset the treatment costs?

Response: The actual recoverable copper was much less than initially expected. Some of the copper could not be separated from the plastic insulation. Much of the exposed copper and aluminum had oxidized and was not recoverable. As detailed in the Focused Feasibility Study, it would actually cost more to extract the copper than the value of the copper. Copper separation would not yield any money to offset treatment costs.

32) Comment: EPA favored treatment until Lucent Technologies suggested capping the Site. Why did EPA change its preference to capping just because Lucent proposed capping?

Response: EPA has an obligation to select safe, ARARs compliant, cost effective remedial actions which are consistent with other remedies at similar sites. EPA did not solicit the capping addendum to the Focused Feasibility and Lucent submitted the capping alternative late in the process. Lucent should have included capping early in the FFS development and should have conducted studies of the fluff to determine if capping was technically viable during the FFS. However, capping is a remedial alternative that has been used at many similar sites, and the Proposed Plan issued in July 1992 actually listed capping as the contingency alternative if the preferred remedial action (recycling) could not be implemented. Since Lucent Technologies would almost certainly bear the burden of the cost of the remedial action, and since EPA had actually proposed capping as a contingency alternative in the 1992 Proposed Plan, EPA allowed Lucent to conduct studies to determine if capping was a viable alternative. This did cause a long delay while capping studies were performed, the risk assessment was reviewed and cleanup levels for soil outside the cap were developed. The results of these studies indicated that capping the site was technically acceptable and that similar sites have generally been capped. If EPA planned to select treatment and offsite disposal, Region 3 would first need to brief EPA's remedy review board in EPA Headquarters. The remedy review board must review all remedies which are above $10 million, and are 50% or more expensive than another remedy which is protective and complies with ARARs. The review board was formed to promote national consistency and to encourage cost effective remedial actions. EPA Region 3 reviewed other similar sites in the Region 3 and concluded that capping was consistent with many previous decisions at similar Site and EPA therefore allowed Lucent to include capping as a remedy in the FFS.

<u>Miscellaneous Comments and Concerns</u>

33) Comment: One person asked where the data is located for past soil sampling and the statistical analysis which produced the contaminant levels used in the risk assessment. He also asked how the dioxin and PCB hotspots were determined.

Response: The data is located in the Remedial Investigation Report, in the Administrative Record file kept at the Rush Township building, R.D.1, Tamaqua, PA 18252 and at the U.S. EPA Office in Philadelphia at 1650 Arch Street, Philadelphia, PA 19103-2029.

Soils Data can be found at the following locations in the Administrative Record:

Remedial Investigation, Section 3.4 Surface and Subsurface Soil Investigation at page AR303074, Section 4.1 Fluff Characterization Results page AR303114, Section 4.3 Soil Characterization Results page AR303125, PCB Analytical results on Figure 4-2.

Feasibility Study, Results of RI Report - Fluff and Soils results, pages AR303486-AR303491.

Details of Endangerment Assessment (The Risk Assessment) - pages AR303504-AR303543.

The most detailed fluff and soil presentation is given in the risk assessment which has the statistical analysis of contaminants including averages, and ranges for the site contaminants in each media. Tables outline risk assumptions and how the risk numbers were calculated. Since this time, there has been additional data collected during the design phase and during the development of the ROD. Most of this data has been placed in the administrative record, but some additional data is only in the EPA Site file.

34) Comment: Why did EPA allow the creation of this massive waste pile and why did EPA allow dioxins, one of the most toxic chemical compounds, to be disposed at the Site?

Response: The disposal of chipped plastic from the wire recycling operations ended in 1978. The EPA did not have any authority over solid and hazardous waste until the RCRA and CERCLA acts were passed in 1980. During the creation of this pile, the waste was only regulated by the state, county and local regulations. The portion of EPA which regulates solid and hazardous waste did not even exist.

Dioxins were never disposed at the Site. Several fires occurred in the fluff pile in the 1970s, which produced the dioxins. Dioxins are produced in smoldering fires when chlorine and other organic precursor molecules are present. The dioxin contaminated fluff has been removed from the Site and sent for incineration under an EPA order to Lucent Technologies.

35) Comment: One resident asked why EPA didn't have better warning signs, since he had never seen the Site.

Response: The purpose of the warning signs is to keep the public from entering the fenced and gated property. Hopefully, these warning signs would prevent trespassers from climbing into the fenced area. The resident had never seen the site and therefore had never seen the signs. His comments suggested that EPA should have a large sign somewhere to notify the public of the presence of a Superfund Site, rather than a sign to prevent access. It is unnecessary for EPA to “advertise” the presence of the Site.

36) Comment: One resident suggested that the past Project Manager may have been involuntarily removed as manager, because he was against capping the fluff pile. The same person alleged that the current project officer showed little interest in the Site, due to the fact that he had never contacted him to see leachate problems which existed on the hillside west of the Site. The same person implied that the Site had been moving in the right direction until Steve Donohue was removed and the new project manager promoted containment. The person also noted numerous other problems that have not been addressed properly.

Response: The previous project manager asked for assistance because of a very intense workload at the Tonnolli landfill in the Fall of 1998. The current project manager offered assistance. At this point, the Focused Feasibility Study and the cap addendum was received and discussed with EPA management. The previous project manager attended the December 1998 meeting, when Lucent asked to include the cap as an alternative. At this meeting, EPA’s management agreed, subject to studies showed that capping was viable to allow Lucent to include capping as an alternative in the FFS. The previous project manager then accepted a new position at EPA. The decision to accept a new position was absolutely voluntary.

The resident expressed satisfaction with the previous project manager’s performance and mentioned several site visits where leachate seeps were pointed out to the previous project manager. The resident appeared angry that the current project manager had never contacted him to discuss the site. This puzzled the current project manager, because this resident had never contacted him, and the previous project manager had never mentioned the resident as a contact. Additionally, the resident’s seemed to blame the current project officer for possible leachate seeps near the river and for the existing operations of the treatment plant, all of which were designed and installed before the current Project Manager was assigned. The current project manager will address these problems if they are due to the landfill, when the leachate collections system is relocated.

The residents primary concern was the health of the Little Schuylkill River. The recent sampling by the PADEP has shown that the river has not been impacted by Site contaminants, regardless of any current seeps that may exist. Iron and manganese are very high in the area and seeps may actually be springs unrelated to the EDM Site. EPA will try to locate these seeps in the Spring.

37) Comment: Why isn’t public opinion the most important factor in EPA’s decision, since the public affected are the taxpayers.

Response: The public is a very broad term which includes many stakeholders, including industry, environmental organizations, nearby residents and taxpayers. Residents living close to a Superfund site often feel that only they are the “public” and that no cost is too high to completely remove the material from their community. However, the other stakeholders often have a very different perspective. Congress considers these differing views when crafting environmental laws, and EPA also takes public comment when issuing new regulations. The agency developed the nine criteria to guide EPA decision makers when selecting remedial actions. Thus, EPA must consider many other factors in addition to the public acceptance of the community living close to the Superfund Site.

38) Comment: A comment was received that the agencies which allowed the creation of the fluff pile should be held liable as PRPs and should contribute money to fund the offsite disposal alternative.

Response: To be liable as a PRP, an agency would have had to dispose of waste, or arrange for disposal of waste at the EDM Site. To EPA's knowledge there are no agencies that meet that criteria.

39) Comment: Instead of capping the Site, EPA should select Solvated Electron Technology to destroy the contaminants.

Response: Solvated Electron Technology is an interesting and effective treatment for the destruction of very toxic compounds (i.e. PCBs, dioxins, chemical weapons) in certain situations. This would not be an appropriate technology for the EDM Site for many reasons. The primary compound of concern at the Site is lead and solvated electron technology would not reduce the toxicity or mobility of the lead. This process uses metallic sodium and liquid ammonia, both of which are dangerous substances to store in large quantities on a Superfund Site. The process generates gases and the potential for explosions if not handled properly. Materials should be dry before treatment and therefore, the process would need an expensive thermal desorption or drying pre-treatment step. The primary reaction results in removal of chlorine atoms and instead of reacting only with PCBs and dioxins, the reagent may react with the chlorine in the PVC. The reagent reacts with metals and most of the reagent might be used up reacting with metals and PVC instead of the most toxic constituents. Additionally, the reaction is not similar to incineration which produces carbon dioxide and water as final products, instead, this type of reaction strips chlorine atoms and can form new molecules of unknown toxicity. Tests with the fluff material would be necessary to determine these products. This process is expensive and is highly corrosive to the treatment vessels. Therefore, very expensive alloys would need to be used in the treatment vessels, increasing the cost. Lead would still need another type of treatment afterwards to pass the TCLP test prior to disposal.

EPA contacted its research and development lab to discuss this technology with its technical experts. They concurred that while this technology is very good for certain materials with very high toxicity, low water and metals content, it is not appropriate for the EDM Site. At the EDM Site, the treatment train would need to include separation of debris from the fluff, thermal desorption or a rotary dryer, solvated electron technology, and stabilization of lead. This would produce an extremely expensive remedial action. The residual treated material may have a strong ammonia smell, producing a public nuisance or would require additional measures to prevent air emissions. This process has some excellent applications, but is not appropriate for the EDM Site.

40) Comment: Congressman Tim Holden expressed frustration with the long delay and EPA's preferred alternative.

Response: EPA is also frustrated by the long delay in this project. The EDM Site is unusually complex, because although the waste is a common plastic, the waste does contain PCBs, lead, dioxin and other chemicals. The presence of lead, PCBs and dioxins creates a very difficult regulatory situation and somewhat limits EPA's options. The extremely large volume of material also presents a substantial problem. EPA lost several years trying to develop a way to recycle this material. EPA believes this was a justified effort and if it could have been realized, all of the fluff would have been removed from the community. Unfortunately, this was not possible and it was then necessary to explore other options and several years were consumed by this process. Selecting a remedy for the fluff was a difficult decision for EPA because of the very strong local opposition to the cap. The technical facts, regulations and policy support capping as the appropriate remedial action at the EDM Site.

41) Comment: One comment suggested that EPA keep its promise to remove all the fluff from the Site. This promise was made when EPA intended to recycle the fluff.

Response: EPA never promised that it would remove all the fluff from the Site. EPA did select a recycling remedy which by its fundamental process, would have resulted in a removal of all fluff from onsite. EPA believed that it was possible to implement this remedy and was strongly committed to its success. Unfortunately this was not possible. EPA also would like to remind the public that the original Proposed Plan for the fluff which preferred a recycling remedial action listed capping as a contingency alternative if recycling proved impractical.

Pennsylvania Department of Environmental Protection

1) PADEP's Comment: The Proposed Plan does not fully recognize the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2.) The Department reasserts that Act 2 and the regulations promulgated under Act 2, Chapter 250, Administration of the Land Recycling Program, are ARARs for the remedy selected under CERCLA 121(d)(2) for this Site. Act 2 allows three options for attaining remediation standards. They are found in Chapter 250 and consist of the Background Standard (Subchapter B), Statewide Health Standards (Subchapter C) and Site Specific Standards (Subchapter D). An evaluation of one of these three options, or a combination of the options, may be incorporated to obtain the remediation standard under Pennsylvania law. In addition, Subchapter C, Section 250.305 specifically requires the soil remediation standard to be the lower [more stringent] medium- specific soil concentrations for the direct contact or the soil to ground water pathways. An equivalency demonstration [ground water modeling] can be substituted for the soil to ground water numeric value using sampling data and fate and transport analysis of the regulated substance in accordance with Chapter 250, Section 250.308.

EPA's proposed soil cleanup standards for lead (1000 mg/kg) and bis(2-ethylhexyl) phthalate- also known as DEHP (500 mg/kg) based on direct contact risks exceed the Departments Statewide Health Standards for lead (450 mg/kg) and DEHP (130 mg/kg) based on soil to ground water pathway values at the Site. Also, EPA has not demonstrated that the proposed numbers would meet any of the standards under Act 2. EPA needs to demonstrate that the chemical-specific ARARs will be met for this Site. If EPA chooses not to accept the Department's more stringent ARARs, the Commonwealth may issue a non-concurrence [letter of disagreement] with the ROD.

EPA's Response: Act 2 of the Land Recycling program is the statutory authority for the State's regulations for the cleanup of contaminated sites. These state regulations have two different sets of numerical cleanup standards for soils. One set of these numerical standards is based on direct contact with the waste, and the other set of numerical standards is based on protection of ground water.

These numbers were revised following issuance of the Proposed Plan. Further, these new levels address the PADEP's concerns. Due to public concerns about the long term reliability and safety of the selected remedy, due to the presence of multiple contaminants and an aggregate risk that was at the higher end of EPA's acceptable risk range, and because of BTAG's recommendations, EPA has decreased the cleanup levels for the compounds above to levels below the ACT II levels cited above. EPA also considered the ACT II levels as part of its decision to lower the levels. Therefore, the asserted ARAR is not stricter than the Federal standard and therefore ACT II is not an ARAR for this ROD. This reduction in dioxin and phthalate level produced an aggregate risk closer to the center of EPA's acceptable risk range and met the BTAG's most stringent phthalate cleanup level. The reduction of lead to 400 ppb was made in consideration of the presence of other contaminants. It also provides the community assurance that even if the fence was not maintained, the lead levels would be safe even for children. The lead is also confined close to the surface and has not migrated deep into soils. EPA believes that if the dioxin and phthalate cleanup levels are achieved, in most areas, the lead standard will be met and that the incremental additional cost of lowering the lead cleanup level will be small.

2) Comment: The Department reserves the right to assert our ARARs [Environmental Regulations] for the remedial design and remedial action of the selected remedy including, but not limited to: closure requirements; subbase requirements; leachate and shallow ground water collection systems and their maintenance; leachate and ground water treatment systems; discharge and maintenance; ground water monitoring systems and plans; ground water diversion trenches and discharge; surface water management systems; etc.

Response: Relevant and Appropriate ARARs must be set specifically at the time of the Record of Decision. Under CERCLA, the PADEP cannot assert new ARARs later at the time of the Remedial Design or Remedial Action. However, EPA will work closely with the PADEP during the review of the Remedial Design and Remedial Action to make sure that PADEP’s substantive technical concerns are addressed.

3) Comment: The Department is concerned about the leachate collection system at the Site. Leachate seeps have occurred periodically on- site and measures have been taken to correct these problems. However, the problems seem to resurface. For an in-place closure remedy, a permanent solution to the leachate collection system needs to be available. One of the factors that may be affecting proper leachate management is the presence of iron feeding bacteria or other forms of bacteria that can cause clogging in the leachate management systems. The Site treatment plant had problems with bacteria clogging in the sand filters/ ion exchange system. The addition of the biological treatment plant has helped resolve this issue. The Department and the PRPs are going on-Site on Monday, December 18, 2000 to visually examine the pipe bedding material to ensure that there are no clogs outside the pipe, or within the collection envelope, that are restricting or preventing leachate from getting into the conveyance pipe.

It is critical to the entire design of this proposed capping remedy to address the concerns of effective leachate collection and specifically, whether this can be accomplished at this Site given the currently known leachate constituents, rainwater pH, ground water chemistry, and clog material analysis. Ongoing maintenance issues should be considered to ensure that the final design can be constructed such that any maintenance problems are defined and able to be readily resolved without the need for a major excavation. Specific clogging prevention measures should be supplemented [supported by documents showing the effectiveness of these measures] with the relevant technical literature that has been demonstrated to be both feasible and effective at other sites. The clogging mechanisms should be similar to this Site [So that the solutions will be effective] and the remedies should address clogging prevention to ensure that they do not become long-term maintenance problems following the placement of the synthetic capping system.

Response: EPA accepts the PADEP’s comments and will address them during the remedial design. The first Record of Decision required an upgrade of the leachate collection and treatment system. This must be maintained and the remedial goal of that action is to eliminate leachate seeps and to collect contaminated leachate. Every subsurface ground water or leachate collection or injection system will need periodic maintenance. There is no solution that will prevent some clogging and buildup in any extraction system, whether it is an extraction well or a leachate collection trench. EPA views this problem as a maintenance issue rather than as a decision criteria.

There are several mechanisms that foul any extraction and leachate collection system over time. The first mechanism is simply the filtration effect of fines becoming trapped in the pores near a leachate collection system or extraction well. This gradually leads to reduced yields as the porosity is decreased over time. The second is bacterial growth due to the nutrients present which often are the contaminants of concern. Iron and manganese are at high levels in background ground water and these metals can be used as a food source by certain bacteria producing fouling. As iron bacteria formations mature, they become mineralized, further reducing the porosity of the formation. Additionally, methane formation under a landfill is generally anaerobic due to methane formation. This produces an environment which mobilizes iron and other metals, which then oxidize once they reach a source of oxygen in a discharge area, producing the characteristically rust colored leachate seeps. There is nothing that unique in the EDM geological environment and these problems must be dealt with in the maintenance plan. There are methods to manage these problems, but nothing will eliminate these problems. EPA will require whatever maintenance is needed to control the leachate seeps.

4) Comment: The NPDES permit expired in 1997 and was not renewed. A determination was made that a permit is not required under CERCLA, however the plant must meet all the permit equivalent requirements. The Department will reevaluate monitoring and effluent limit requirements during the remedial design/ remedial action.

Response: After the PADEP finalizes the new NPDES levels, EPA and Lucent will review the new limits to be applied to the effluent from the treatment plant.

5) Comment: The remedy should comply with all State and Local ARARs including storm water management. The local authorities should be notified and involved at the beginning of the remedial design process.

Response: EPA agrees that the remedy should comply with all ARARs asserted during the FS and the ROD comment period. EPA will keep the local officials informed during the Remedial Design and Remedial Action.

6) Comment: During regulatory review, it was discovered that a proposed revision to the Universal Waste Rule in February for PCB LDRs of 1000 ppm. EPA should investigate the final status of this rule. Depending on when it is finalized, the cost of the removal options could be greatly reduced.

Response: This comment was discussed with the Region 3, RCRA Land Disposal Restriction contact, Mr. Douglas Donor. He gave me the following explanation:

“EPA did publish a **proposed rule** on February 16, 2000 in the FR that was a proposed revision to the **LDR Phase IV Rule** (not the Universal Waste regulations). As a proposed Rule it **is not effective**. EPA has recognized that the Underlying hazardous constituents (UHCs), which includes PCBs, and have a LDR Universal Treatment Standards (UTS) of 10 ppm, is a problem in cleanups. If the alternative soil standard is allowed for PCBs the LDR standard could either be 90% reduction or treated to no lower than 10X the UTS, or 100 ppm. This has been a problem at many sites with PCB waste, especially since EPA issued a Final PCB Rule on June 29, 1998 that allowed bulk PCB remediation waste including soils containing up to 50 ppm PCBs to be disposed without treatment in either a RCRA subtitle C or a TSCA (but not a municipal) landfill. If the revision to the LDR Phase IV becomes final, EPA would change the LDR soil standard for PCBs to 1000 ppm, the old LDR California List standard. Although any soil contaminated with PCBs at less than 1000 ppm would be out of RCRA, the disposal would still be subject to TSCA unless they were less than 50 ppm. I do not believe any TSCA waste can go to a municipal landfill unless that landfill also has a TSCA permit. If the waste is to be disposed prior to EPA’s issuance of a Final Rule, which will have to adopted by the States, that soil would have to meet the current LDR treatment standard for PCBs as a UHC, of either 10 ppm for as-generated waste, or 100 ppm for PCBs in soil. Since PADEP adopts changes to Federal law by reference, at the time it becomes effective, it will be effective in Pennsylvania.” ”

In summary, there is no relief until the new regulation is passed, and we would still have to treat waste to 10 ppm or 100 ppm in soils. Additionally, although the soil would not be subject to RCRA, we would have to send the treated soil to a TSCA landfill at great expense. The change in the RCRA rule is for soils below 1000 ppm only and would not exempt the fluff. There are 250,000 cubic yards of fluff and we only expect there to be about 10,000 cubic yards of soil. This regulatory change would a significant difference in the factors which led to the selected remedy even if it does eventually go through. It would not substantially reduce costs for disposal.

7) Response: The Department shares EPA’s desire to provide land at the Site for potential redevelopment. However, the primary concern at the Site for an in- place closure remedy should be the best design of the landfill closure. If creating land for redevelopment compromises the quality of the landfill design, for example, by placement of the additional waste in proximity to the surface water or by increasing the steepness of the slopes, the plan should be eliminated.

Response: EPA will work closely with the PADEP during the design review to make sure that the cap is designed properly. EPA did not specify exactly how much land can be made available and the design of the cap will not be compromised to provide for usable land. EPA and Lucent believe some land can be supplied without compromising the remedy, although at a slight increase in cost.

Lucent Technologies

Note: All of Lucent’s comments supported the preferred alternative, did not ask any questions and, therefore, no response is necessary.

Attachments/Enclosures